

# 2017 Pore Water Characterization Report, Institute Facility, Institute, West Virginia

*Prepared for*  
**Union Carbide Corporation**

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**ch2m**<sup>SM</sup>

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# Acronyms and Abbreviations

|          |  |
|----------|--|
| BAZ      | biologically active zone   |
| CH2M     | CH2M HILL Inc.   |
| COPC     | constituent of potential concern   |
| CSM      | conceptual site model  |
| facility | Union Carbide Corporation Institute Facility in Institute, West Virginia |
| HPH      | High Purity Hydrocarbons   |
| RCRA     | Resource Conservation and Recovery Act                                   |
| UCC      | Union Carbide Corporation  |
| USEPA    | U.S. Environmental Protection Agency                                     |
| VOC      | volatile organic compound  |
| WVDEP    | West Virginia Department of Environmental Protection                     |

# Introduction

This report documents the results of the September 2017 pore water field investigation conducted along the Kanawha River adjacent to the High Purity Hydrocarbons (HPH) and Tank 1010 areas at the Union Carbide Corporation (UCC, a wholly owned subsidiary of The Dow Chemical Company) Institute Facility in Institute, West Virginia (facility). The work is part of the Resource Conservation and Recovery Act (RCRA) Corrective Action process conducted under the authority of the U.S. Environmental Protection Agency (USEPA). The 2017 pore water sampling was conducted to confirm the findings from the previous pore water sampling event.

## 1.1 Site Background

The facility is located in Institute, West Virginia, adjacent to the Kanawha River (Figure 1-1). The facility occupies 433 acres consisting of two distinct areas, the main chemical plant and the wastewater treatment plant. The site is within the Kanawha River floodplain, with an elevation of 600 feet above mean sea level, and its topography is relatively flat, except for steep slopes along the riverbank.

The facility began operations in 1943 as a synthetic rubber production plant during World War II owned by the federal government. UCC purchased and operated the facility from 1947 to 1986.

Rhone-Poulenc purchased the facility in 1986 and became Aventis CropScience in January 2000. Aventis CropScience became Bayer CropScience in 2002. UCC repurchased the facility in 2015. The main chemical plant historically produced various hydrocarbon and agricultural products. More detailed information regarding historical activities at the facility and associated investigations is provided in RCRA facility investigation reports (UCC 1995, 2001; KEMRON Environmental Services 2003; Key Environmental, Inc. 2006; CH2M HILL Inc. [CH2M] 2005), *2012 Pore Water Characterization Report* (CH2M 2012a), *Current Conditions Report* (CH2M 2018), and other reports referenced herein.

## 1.2 Previous Pore Water Investigations

### 1.2.1 July 2009 Investigation

The July 2009 field activities were performed in accordance with the *Kanawha River Investigation Work Plan and Phase I Sampling and Analysis Plan* (CH2M 2008). The investigation was part of the TW-63A/TW-63B source area investigation (CH2M 2010a) to investigate an area of elevated concentrations of volatile organic compounds (VOCs), specifically benzene, measured in monitoring wells TW-63A and TW-63B, which are adjacent to the Kanawha River. Two data quality objectives were developed for this investigation:

- Locate and delineate the source area for the observed elevated groundwater benzene concentrations near monitoring well cluster TW-63A/TW-63B
- Collect data needed for remedial action design and implementation

Pore water samples were collected from three locations adjacent to the facility (two in the HPH and Tank 1010 areas [Figure 1-2], and one additional location down river) to provide an indication of VOC concentrations in pore water beneath the Kanawha River adjacent to areas of known VOC-impacted groundwater at the facility.

## 1.2.2 December 2012 Investigation

The December 2012 pore water investigation targeted locations that were spatially distributed to be inclusive of the mapped extent of benzene in groundwater (CH2M 2012b). The following data quality objectives were developed for the investigation:

- Collect Kanawha River pore water samples adjacent to the HPH and Tank 1010 areas at the facility to determine pore water VOC concentrations
- Based on VOC pore water results:
  - Evaluate attenuation factors for groundwater to pore water and adjust the site-specific groundwater cleanup levels, if appropriate
  - Adjust area of potential remedial action, as appropriate, based on the area where pore water concentrations exceed cleanup levels

Twenty-four samples were collected adjacent to the HPH Area (8 locations) and Tank 1010 Area (16 locations). Samples were collected in transects consisting of three locations: near shore, mid, and outer locations (Figure 1-2).

Results of the 2009 and 2012 pore water investigations indicate VOC concentrations in pore water in the HPH and Tank 1010 areas were below established screening levels for the Kanawha River, except for toluene at one location in the HPH Area. Available hydrogeologic and VOC concentration data indicate the pore water samples were collected in locations where VOC-impacted groundwater is expected to discharge through pore water into the Kanawha River.

## 1.3 Investigation Objectives

The objectives of the 2017 pore water investigations were to confirm the findings of the previous pore water sampling events and collect additional information to gain an understanding of benzene and petroleum hydrocarbon biodegradation between the onsite area and pore water.

## 1.4 Report Organization

This report is divided into six sections:

- Section 1 is an overview and describes the investigation objectives.
- Section 2 describes the activities performed for the Kanawha River investigation.
- Section 3 discusses the facility conceptual site model (CSM).
- Section 4 presents the results of the pore water sampling and analysis for each remediation area.
- Section 5 summarizes the conclusions of the Kanawha River investigation.
- Section 6 lists the references cited in the report.

The appendixes contain supporting information.

# Investigation Activities and Sampling Methodology

The 2017 pore water investigation activities followed the methodologies outlined in the standard operating procedure for Trident probe sampling (CH2M 2012b). This section summarizes the investigation activities.

Twelve pore water locations were sampled between September 26 and September 28, 2017 (Figure 1-2). The same locations were sampled previously in 2012, and the targeted stations were selected to provide sufficient coverage, inclusive of previously detected VOCs and in areas where the highest VOC concentrations potentially would be expected (based on onshore groundwater VOC concentrations) and groundwater flow patterns. These proposed targeted 12 pore water locations were presented to USEPA and the West Virginia Department of Environmental Protection (WVDEP) on September 11, 2017, and received verbal endorsement on the locations and sampling approach.

A Trident probe was used to collect pore water samples from a boat in the Kanawha River. The Trident probe is a direct-push technology system equipped with temperature, conductivity, and water sampling probes. Contrasts in temperature and conductivity between surface water and groundwater were used to determine if the locations sampled were representative of areas of venting groundwater. Onboard measurement of oxidation-reduction potential, pH, temperature, and conductivity differentials confirmed the samples were pore water and not surface water.

The water sampling probe was used to collect the pore water samples for laboratory analysis. The sampling probes were equipped with sand pack prefilters (well driller sand) that reduce sample turbidity and improve collection efficiency. The Trident probe system also was equipped with a metal plate that served as a depth guide for probe insertion and prevented surface water drawdown.

Surface water parameters were measured at each sampling location before the Trident probe was advanced in sediment. The probe then was advanced to a maximum depth of 12 inches below sediment surface, and in situ measurements of temperature, specific conductance, oxidation-reduction potential, and pH of the pore water were compared to the surface water parameters. Upon verification that pore water was encountered, one pore water sample was collected at each location and subsequently submitted to Microbac Laboratories in Marietta, Ohio, for VOC analysis using USEPA Method 8260B. In addition, the samples were analyzed for methane via Method RSK-175.

# Conceptual Site Model

This section presents a condensed, updated version of the CSM. A detailed version of the CSM is in the *Current Conditions Report* (CH2M 2009a).

## 3.1 Site Setting

The facility is in a relatively flat, low-lying area, partly because of onsite filling and grading activities conducted in the past to support industrial operations adjacent to the Kanawha River. North of State Route 25, which parallels the northern facility boundary, the topography becomes comparably steeper as the landscape transitions from the floodplain to hilly slopes. In general, the southern facility border that abuts the Kanawha River consists of steep slopes covered by riprap.

## 3.2 Geology and Hydrogeology

The facility is located along a narrow elevated alluvial plain (1,200 to 3,500 feet wide) along the banks of the Kanawha River. A steep slope approximately 30 feet high is present along the river that transitions to a generally flat plain with a gentle slope toward the river. Beyond the northern facility boundary, the topography rises several hundred feet sharply up into a hilly area above the Kanawha River Valley.

Subsurface conditions at the facility are typical for this physiographic setting, consisting of a sequence of alluvial deposits associated with the ancestral Kanawha River. These alluvial deposits are approximately 55 to 60 feet thick and consist primarily of interbedded gravel, sand, silt, and clay deposits. The thickness of the alluvium thins dramatically along the northern side of the facility as bedrock rises up to the hilly area. Site development has resulted in the addition to human-made and natural fill materials that range from 0 to approximately 10 feet thick.

Overall, the alluvial deposits represent a fining-upwards sequence with the coarse-grained gravel found along the alluvium/bedrock interface, and fine-grained silt and clay predominating in the upper portion of the sequence. An important subsurface feature is the presence of relatively thick strata of clay and silt along the riverbank.

The hydrogeologic system is strongly influenced by the physical conditions at the facility. Groundwater at the facility is found under two different conditions. The first consists of perched zones within low-permeability silt/clay horizons. These zones are limited in aerial extent and do not form a continuous hydrostratigraphic unit across the facility. The second zone consists of the underlying unconfined coarser-grained alluvial aquifer whose potentiometric surface is typically found at depths of 15 to 20 feet below ground surface. Groundwater in the aquifer system is primarily recharged by precipitation at the facility, with a limited amount of recharge from colluvium and bedrock from the adjacent upland areas. Groundwater flow is generally toward the Kanawha River, which is normally a gaining stream component.

## 3.3 Constituent Conditions

Previous investigations of the HPH and Tank 1010 areas identified benzene as the primary constituent of potential concern (COPC). Other COPCs identified at concentrations an order of magnitude lower than benzene include ethylbenzene, toluene, and total xylenes (CH2M 2010a, 2010b, 2011, 2012a). In the HPH and Tank 1010 areas, benzene in groundwater flows toward the Kanawha River and is in close proximity to the river. Generally, benzene concentrations increase with depth in the aquifer.

## 3.4 Exposure Pathways

Exposure refers to the potential contact of a receptor with a chemical. USEPA (1998) describes exposure pathways in terms of five primary components:

- A source and mechanism of chemical release
- A retention or transport medium
- An environmental transport mechanism
- A point of receptor contact with the contaminated medium (known as the exposure point)
- An exposure route (such as ingestion) at the contact point

These five components must be present for a potential exposure pathway to be considered complete and for exposure to occur. Potentially complete exposure pathways related to groundwater are discussed below for human and ecological receptors.

### 3.4.1 Human Exposure Pathways

Potential human exposure pathways related to the Kanawha River include use as a drinking water source and recreational fish ingestion. The fish ingestion pathway was evaluated previously and presented in the *Groundwater to Surface Water Screening Levels and Risk Evaluation Report* (CH2M 2012c). Drinking water was not evaluated previously as a potentially complete exposure pathway because the Kanawha River was not designated as a drinking water source until June 2016 (effective July 2016 [WVDEP 2016]). As a result, this report presents the drinking water exposure pathway evaluation; fish ingestion is not included because it was presented previously and evaluating potential use of the Kanawha River as a drinking water source is a more conservative evaluation than that for fish tissue ingestion.

### 3.4.2 Ecological Receptor/Pathways

The following are considered complete pathways for ecological receptors:

- Exposure, by direct contact, of benthic organisms (i.e., invertebrates and fish) to constituents in pore water
- Exposure, by direct contact, of water column (i.e., pelagic) organisms (i.e., invertebrates and fish) to constituents in surface water following venting of pore water

Groundwater at the facility is not considered an exposure medium because it is not possible for ecological receptors to encounter groundwater until it discharges to a surface water body. Because of the presence of the Kanawha River, and known hydrogeological linkages to the site, groundwater is considered an important transport medium that links the facility to this riverine habitat. Upwelling (venting) groundwater, along with constituents with which it might be contaminated, may enter surface water as it passes through sediment. The transition zone at the surficial sediment is referred to as the groundwater-surface water interface and represents the zone over which the hydrology shifts from a groundwater-dominated to a surface water-dominated environment.

The top of transition zone is considered the biologically active zone (BAZ) since most of the benthic macroinvertebrate community is expected to reside here. Based on the behavior of the type of organisms expected to occupy the BAZ (e.g., bivalves, snails, amphipods, fish, aquatic insects, etc.), it is assumed to be approximately 12 inches deep. Venting contaminated pore water through the BAZ is the primary mechanism of potential exposure for ecological receptors in the BAZ. Additionally, because of dilution at the groundwater-surface water interface, especially in strongly flowing environments such as the Kanawha River, secondary (less severe) exposures to vented contaminated groundwater typically occur for aquatic biota that exclusively occupy the water column (e.g., fish and plankton).

# Pore Water Characterization Results

This section presents the results from the pore water sampling events, including a brief evaluation of the pore water concentrations relative to the established surface water screening levels, as well as an overview of the basis of the surface water screening levels. After each pore water sampling event, the data were validated in accordance with the *West Virginia Operations Program Quality Assurance Project Plan* (CH2M 2012d). Appendixes A and B contain the data quality evaluation reports and laboratory analytical reports, respectively, for each pore water investigation.

## 4.1 Pore Water Screening Levels

Pore water screening levels were derived for site-specific VOCs using the iterative process presented in the *Groundwater to Surface Water Screening Levels and Risk Evaluation Report* (CH2M 2012c) and current USEPA regional screening levels for tap water (USEPA 2017; adjusted using the site-specific dilution attenuation factor for groundwater to the Kanawha River [CH2M 2009b]). The screening levels were established to be protective of potential Kanawha River exposure pathways for human and ecological receptors (Table 4-1).

The pore water screening levels were compared to pore water VOC concentrations to identify COPCs by remediation area. A constituent concentration greater than its respective surface water screening criterion indicated a potential risk to Kanawha River receptors, and as such, that constituent was retained as a COPC for the remediation area.

## 4.2 Sampling Conditions

The sampling event occurred when river levels were stable and between rain events (Figure 4-1). Water quality parameters were collected at each sampling location to verify the Trident probe was fully deployed into sediment and pore water was being purged (Table 4-2). The water quality parameters show a distinct differential between surface water and pore water, indicating the samples were pore water (Figures 4-2 and 4-3). River stage data also were obtained from the U.S. Geological Survey website during the 2017 event to determine the samples were collected during optimal river conditions (Figure 4-3).

## 4.3 VOC Pore Water Results

Twelve pore water samples were collected and analyzed for site-specific VOCs in 2017, and three VOCs were detected (Table 4-3). The detected VOCs were less than their respective pore water screening criteria. Diethyl ether was detected at seven locations at a maximum concentration of 81.5 micrograms per liter (INS-0309), which is below the pore water screening level. Chlorobenzene was detected at three locations (INS-293, INS-297, and INS-306), and naphthalene was detected at two locations (INS-306 and INS-311); the chlorobenzene and naphthalene detections did not exceed their respective pore water screening criterion.

## 4.4 Methane Pore Water Results

Twelve pore water samples were collected and analyzed for methane, with methane detections in all 12 samples (Tables 4-3). In general, methane concentrations were highest in nearshore locations and decreased at stations further from shore (Figure 4-4). Pore water screening values are not established for methane. Methane analysis was included as a potential indicator of biodegradation processes.

# Summary and Conclusions

Twelve pore water confirmation samples were collected in 2017 at a subset of the 2012 pore water stations. The results of the 2017 pore water investigation indicate pore water VOC concentrations are below respective pore water screening values. In 2012, toluene was encountered just above the pore water screening value; however, in 2017, toluene concentrations were nondetect. Table 5-1 contains a comparison of the 2009, 2012, and 2017 pore water data. The results are generally consistent with previous sampling events with detected concentrations generally lower in 2017 in comparison to 2012 and 2009 data. As a result, VOCs in groundwater are not discharging to the Kanawha River at concentrations that would pose unacceptable risk to human health or the environment.

During the 2017 pore water investigation, river level data indicated samples were collected during stable conditions when groundwater normally discharges to surface water. Quality control samples from the field event indicate pore water was collected from the sampler. These data indicate the pore water sampling events collected representative samples of pore water and that the data can be used to characterize the groundwater/pore water relationship. Locations were targeted in areas where the highest VOC concentrations would be expected, if present.

Methane concentrations were highest nearshore and generally adjacent to areas where highest concentrations of benzene in groundwater were encountered. Methane concentrations generally decreased further from shore. The presence of methane, combined with the geochemical conditions of the pore water (i.e., negative oxidation-reduction potential, and the absence of benzene in pore water but presence in onshore groundwater) provides potential lines of evidence that anaerobic biodegradation of benzene is occurring.

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SECTION 6 – REFERENCES

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# Tables

**Table 4-1. Selected Pore Water Screening Levels**

2017 Pore Water Characterization Report, UCC Institute Facility, Institute, West Virginia

| Detected VOC             | Dilution Factor | Screening Values (µg/L) |                           |                            |                               | Selected Cleanup Level for Pore Water |              |
|--------------------------|-----------------|-------------------------|---------------------------|----------------------------|-------------------------------|---------------------------------------|--------------|
|                          |                 | Ecological              |                           | Human Health               |                               |                                       |              |
|                          |                 | Benthic                 | Water Column <sup>a</sup> | Tap Water RSL <sup>b</sup> | Surface Water <sup>a, b</sup> | Value (µg/L)                          | Type         |
| 2-Butanone               | 3574            | 1.4E+04                 | 5.0E+07                   | 5.6E+03                    | 2.0E+07                       | 1.4E+04                               | Benthic      |
| Acetone                  |                 | 1.5E+03                 | 5.4E+06                   | 1.4E+04                    | 5.0E+07                       | 1.5E+03                               | Benthic      |
| Carbon Disulfide         |                 | 1.1E+01                 | 3.8E+04                   | 8.1E+02                    | 2.9E+06                       | 1.1E+01                               | Benthic      |
| Chloroform               |                 | 3.4E+03                 | 1.2E+07                   | 2.2E-01                    | 7.9E+02                       | 7.9E+02                               | Human Health |
| 1,1-Dichloroethane       |                 | 4.7E+01                 | 1.7E+05                   | 2.8E+00                    | 1.0E+04                       | 4.7E+01                               | Benthic      |
| 1,1-Dichloroethene       |                 | 2.5E+01                 | 8.9E+04                   | 2.8E+02                    | 1.0E+06                       | 2.5E+01                               | Benthic      |
| 1,2,4-Trichlorobenzene   |                 | 1.1E+02                 | 3.9E+05                   | 1.2E+00                    | 4.3E+03                       | 1.1E+02                               | Benthic      |
| 1,2-Dichlorobenzene      |                 | 1.4E+01                 | 5.0E+04                   | 3.0E+02                    | 1.1E+06                       | 1.4E+01                               | Benthic      |
| 1,2-Dichloroethane       |                 | 1.0E+02                 | 3.6E+05                   | 1.7E-01                    | 6.1E+02                       | 1.0E+02                               | Benthic      |
| 1,2-Dichloropropane      |                 | 8.3E+03                 | 3.0E+07                   | 8.5E-01                    | 3.0E+03                       | 3.0E+03                               | Human Health |
| 1,3-Dichlorobenzene      |                 | 7.1E+01                 | 2.5E+05                   | 4.8E-01                    | 1.7E+03                       | 7.1E+01                               | Benthic      |
| 1,4-Dichlorobenzene      |                 | 1.5E+01                 | 5.4E+04                   | 4.8E-01                    | 1.7E+03                       | 1.5E+01                               | Benthic      |
| 1,4-Dioxane              |                 | 2.3E+04                 | 8.1E+07                   | 4.6E-01                    | 1.6E+03                       | 1.6E+03                               | Human Health |
| Benzene                  |                 | 1.3E+02                 | 4.6E+05                   | 4.6E-01                    | 1.6E+03                       | 1.3E+02                               | Benthic      |
| Bromoform                |                 | 1.4E+02                 | 5.0E+05                   | 3.3E+00                    | 1.2E+04                       | 1.4E+02                               | Benthic      |
| Chlorobenzene            |                 | 6.4E+01                 | 2.3E+05                   | 7.8E+01                    | 2.8E+05                       | 6.4E+01                               | Benthic      |
| cis-1,2-Dichloroethene   |                 | 5.9E+02                 | 2.1E+06                   | 3.6E+01                    | 1.3E+05                       | 5.9E+02                               | Benthic      |
| Diethyl ether            |                 | 8.3E+02                 | 2.9E+06                   | 3.9E+03                    | 1.4E+07                       | 8.3E+02                               | Benthic      |
| Ethylbenzene             |                 | 7.0E+00                 | 2.5E+04                   | 1.5E+00                    | 5.4E+03                       | 7.0E+00                               | Benthic      |
| Naphthalene              |                 | 1.9E+02                 | 6.9E+05                   | 1.7E-01                    | 6.1E+02                       | 1.9E+02                               | Benthic      |
| Styrene                  |                 | 7.2E+01                 | 2.6E+05                   | 1.2E+03                    | 4.3E+06                       | 7.2E+01                               | Benthic      |
| Tetrachloroethylene      |                 | 9.8E+01                 | 3.5E+05                   | 1.1E+01                    | 3.9E+04                       | 9.8E+01                               | Benthic      |
| Toluene                  |                 | 1.0E+01                 | 3.6E+04                   | 1.1E+03                    | 3.9E+06                       | 1.0E+01                               | Benthic      |
| trans-1,2-Dichloroethene |                 | 9.7E+02                 | 3.5E+06                   | 3.6E+02                    | 1.3E+06                       | 9.7E+02                               | Benthic      |
| Trichloroethylene        |                 | 4.7E+01                 | 1.7E+05                   | 4.9E-01                    | 1.8E+03                       | 4.7E+01                               | Benthic      |
| Vinyl chloride           |                 | 9.3E+02                 | 3.3E+06                   | 1.9E-02                    | 6.8E+01                       | 6.8E+01                               | Human Health |
| Xylenes, total           |                 | 6.7E+01                 | 2.4E+05                   | 1.9E+02                    | 6.8E+05                       | 6.7E+01                               | Benthic      |

<sup>a</sup> - Screening level with dilution factor applied. Refer to text for dilution factor information.<sup>b</sup> - USEPA Regional Screening Level for tap water (USEPA, 2017; <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017>)

The RSL for 1,4-dichlorobenzene is used as a surrogate value for 1,3-dichlorobenzene

µg/L - micrograms per liter

**Table 4-2. Trident Probe Water Quality Data**  
2017 Pore Water Characterization Report, UCC Institute Facility, Institute, West Virginia

| Station  | Sample                | On Station Time | Off Station Time | Water Depth (ft) | Sample Date | Start Sample Time | End Sample Time | Field Measurements               |               |               |                                  |                    |                    |              |  | Field Notes    |                        |      |  |   |                   |
|----------|-----------------------|-----------------|------------------|------------------|-------------|-------------------|-----------------|----------------------------------|---------------|---------------|----------------------------------|--------------------|--------------------|--------------|--|----------------|------------------------|------|--|---|-------------------|
|          |                       |                 |                  |                  |             |                   |                 | Coordinates (Trimble - Submeter) |               |               | Trident Probe ( <i>in situ</i> ) |                    |                    |              | Ultrameter ( <i>ex situ</i> ) <sup>1</sup> |                |                        |      | Previous Location                      | Substrate Notes   | Sampling Comments |
|          |                       |                 |                  |                  |             |                   |                 | Latitude ° N                     | Longitude ° W | Accuracy (cm) | Temp (°C)                        | Water Cond (µS/cm) | Water Cond (µS/cm) | pH           | ORP (mV)                                   | TDS (mg/L)     | Temp (°C) <sup>1</sup> |      |  |   |                   |
| INS-0293 | SW<br>PW <sup>2</sup> | --              | --               | 1                | 9/26/17     | 14:25             | 14:49           | 38.37989659                      | 81.78351999   | 1.1m          | 25.89<br>24.353                  | 235<br>1,018       | 223.2<br>911.8     | 7.57<br>6.84 | 77<br>-147                                 | 101<br>426.1   | --<br>--               | 0293 | fine sand                              | reference probe was 6 inches deep due to shallow water depth, conductivity ( <i>in-situ</i> ) was adjusted on 9/27/17 after coefficient calibration |                   |
| INS-0297 | SW<br>PW              | --              | --               | 6.2              | 9/26/17     | 15:40             | 16:05           | 38.37967814                      | 81.78302152   | 79.0          | 24.843<br>24.116                 | 232<br>365         | 223.3<br>305.9     | 6.3<br>6.97  | 266<br>-144                                | 101.0<br>139.2 | --<br>--               | 0297 | hard sand, rocks                       | move probe offshore slightly due to rocks, southwest conductivity ( <i>in-situ</i> ) was adjusted on 9/27/17 after coefficient calibration          |                   |
| INS-0019 | SW<br>PW              | --              | --               | 11.6             | 9/27/17     | 10:45             | 10:57           | 38.37968171                      | 81.78323504   | 52.0          | 24.47<br>23.953                  | 233<br>704         | 223.4<br>605.0     | 6.58<br>6.26 | 243<br>-106                                | 101.5<br>264.8 | 24.8<br>--             | 0019 | sand and rocks                         | drop hammer used, probe moved due to rocks (~3 feet), close to Outfall 003  |                   |
| INS-0298 | SW<br>PW              | --              | --               | 16.2             | 9/27/17     | 11:40             | 11:50           | 38.37962730                      | 81.78321718   | 1.5m          | 24.463<br>24.107                 | 232<br>628         | 298.2<br>432.9     | 6.2<br>6.47  | 161<br>-131                                | 137.3<br>199.3 | 25.5<br>--             | 0298 | rocky sand                             | drop hammer used, close to Outfall 003  |                   |
| INS-0300 | SW<br>PW              | 12:30           | 15:23            | 19.7             | 9/27/17     | 14:00             | 15:00           | 38.37939126                      | 81.78254537   | 87.0          | 24.531<br>24.064                 | 234<br>421         | 344.0<br>488.6     | 6.3<br>7.22  | 165<br>-67                                 | 158.3<br>214.4 | 25.8<br>--             | 0300 | rocky sand                             | drop hammer used, poor flow, pull probe and try again, pumping 3 milliliters per minute   |                   |
| INS-0301 | SW<br>PW              | 15:27           | 16:25            | 21.2             | 9/27/17     | 15:55             | 16:09           | 38.37931492                      | 81.78260827   | 69.0          | 24.547<br>24.611                 | 235<br>542         | 279.9<br>475.9     | 6.58<br>6.35 | 189<br>-88                                 | 127.7<br>214.3 | 27.0<br>--             | 0301 | rocky sand layer with clay layer below | drop hammer used  |                   |
| INS-0305 | SW<br>PW              | 16:30           | --               | 10.8             | 9/27/17     | 16:55             | 17:04           | 38.37935674                      | 81.78212831   | 1.2m          | 24.678<br>23.967                 | 235<br>601         | 219.2<br>566.3     | 6.39<br>6.29 | 179<br>-87                                 | 99.97<br>239.9 | 26.4<br>--             | 0305 | sand and rocks                         |   |                   |
| INS-0020 | SW<br>PW              | 9:18            | 11:15            | 20.2             | 9/28/17     | --                | --              | 38.37929596                      | 81.78219998   | 69.0          | --<br>--                         | --<br>--           | 291.7<br>--        | 6.21<br>--   | 210<br>--                                  | 134<br>--      | 23.5<br>--             | 0020 | sand and rocks                         | could not get sample - will offset to INS-0315  |                   |
| INS-0306 | SW<br>PW              | 11:17           | 12:20            | 22.3             | 9/28/17     | 11:50             | 12:05           | 38.37920512                      | 81.78224159   | 84.0          | 24.603<br>24.455                 | 233<br>545         | 227.7<br>393.7     | 6.02<br>6.49 | 221<br>-89                                 | 103.8<br>181.3 | 23.8<br>--             | 0306 | rocky sand layer with clay layer below | offset slightly for dry spot, drop hammer used  |                   |
| INS-0315 | SW<br>PW              | 12:26           | 13:40            | 20.5             | 9/28/17     | 13:00             | 13:20           | 38.37926676                      | 81.78213591   | 58.0          | 24.612<br>23.245                 | 236<br>628         | 223.4<br>561.3     | 6.62<br>6.58 | 175<br>-114                                | 101.6<br>238.6 | 24.4<br>--             | 0315 | silty clay                             | drop hammer used  |                   |
| INS-0309 | SW<br>PW              | 13:55           | 14:54            | 6.9              | 9/28/17     | 14:25             | 14:34           | 38.37916778                      | 81.78163809   | 65.0          | 24.631<br>23.144                 | 235<br>612         | 222.5<br>548.2     | 6.36<br>6.48 | 151<br>-107                                | 101.3<br>230   | 24.9<br>--             | 0309 | silty sand                             | drop hammer used  |                   |
| INS-0310 | SW<br>PW              | 14:55           | 17:12            | 19.6             | 9/28/17     | 15:50             | 16:50           | 38.37907143                      | 81.78169357   | 67.0          | 24.622<br>23.977                 | 234<br>715         | 226.1<br>574.6     | 6.43<br>7.46 | 165<br>-15                                 | 102.8<br>244.8 | 24.9<br>--             | 0310 | sandy clay                             | station moved inshore 15 feet due to large boulders, drop hammer used   |                   |
| INS-0311 | SW<br>PW              | 17:15           | 17:55            | 20.8             | 9/28/17     | 17:40             | 17:50           | 38.37901204                      | 81.78172246   | 61.0          | 24.638<br>24.216                 | 235<br>619         | 219.9<br>534.6     | 6.33<br>6.41 | 229<br>-99                                 | 99.98<br>223   | 24.9<br>--             | 0311 | sandy with clay layer (2")             | drop hammer used  |                   |

Notes:

1 - Pore water temperature not collected from Ultrameter since values are artificially high due to running through long length of tubing in the sun; Trident Probe temp data considered most accurate

2 - Center of the Trident screen is at 5" for the shallow pore water interval (0-12")

°C - degrees Celsius

µS/cm - microSiemens per centimeter

cm - centimeters

mg/L - milligrams per liter

ORP - oxidation-reduction potential

TDS - total dissolved solids

Table 4-3. Summary of Analytical Results - 2017 Data

2017 Pore Water Characterization Report, UCC Institute Facility, Institute, West Virginia

| Volatile Organic Compounds<br>(mg/L) | Location<br>Sample ID<br>Sample Date | INS-0019       | INS-0293       | INS-0293        | INS-0297       | INS-0298       | INS-0300       | INS-0301       | INS-0305       | INS-0306       | INS-0309       | INS-0310       | INS-0311       | INS-0315       |
|--------------------------------------|--------------------------------------|----------------|----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                      |                                      | 0019-PW-092717 | 0293-PW-092617 | 0293-PW-092617D | 0297-PW-092617 | 0298-PW-092717 | 0300-PW-092717 | 0301-PW-092717 | 0305-PW-092717 | 0306-PW-092817 | 0309-PW-092817 | 0310-PW-092817 | 0311-PW-092817 | 0315-PW-092817 |
| Pore Water Screening<br>Levels*      |                                      |                |                |                 |                |                |                |                |                |                |                |                |                |                |
| 1,1,2,2-Tetrachloroethane            | --                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| 1,1,2-Trichloroethane                | --                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| 1,1-Dichloroethane                   | 47                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| 1,1-Dichloroethene                   | 25                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| 1,2-Dichloroethane                   | 100                                  | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| 1,2-Dichloropropane                  | 3038                                 | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| 1,2,4-Trimethylbenzene               | --                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| 1,4-Dichlorobenzene                  | 15                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| 1,3,5-Trimethylbenzene               | --                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| 1,3-Dichlorobenzene                  | 71                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| 2-Butanone                           | 14000                                | 5U             | 5U             | 5U              | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             |
| 4-Methyl-2-Pentanone                 | --                                   | 5U             | 5U             | 5U              | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             |
| Acetone                              | 1500                                 | 5U             | 5U             | 5U              | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             |
| 2-Hexanone                           | --                                   | 5U             | 5U             | 5U              | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             | 5U             |
| Benzene                              | 130                                  | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Bromodichloromethane                 | --                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Bromomethane                         | --                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Carbon disulfide                     | 10.5                                 | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Carbon tetrachloride                 | --                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Chlorobenzene                        | 64                                   | 1U             | 38.8           | 42.2            | 3.3            | 1U             | 1U             | 1U             | 1U             | 2.4            | 1U             | 1U             | 1U             | 1U             |
| Chloroform                           | 786                                  | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Dibromochloromethane                 | --                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Dichlorodifluoromethane              | --                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Chloromethane                        | --                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| cis-1,2-Dichloroethene               | 590                                  | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Diethyl ether                        | 825                                  | 10U            | 10U            | 10U             | 10U            | 10U            | 10U            | 27.6           | 41.3           | 27.1           | 81.5           | 16.7           | 59.1           | 64.0           |
| Ethylbenzene                         | 7                                    | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Methylene chloride                   | --                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Naphthalene                          | 193                                  | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1.2            | 1U             | 1U             | 31.4           | 1U             |
| Styrene                              | 72                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Tetrachloroethene                    | 98                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Toluene                              | 10                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| trans-1,2-Dichloroethene             | 970                                  | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Trichloroethene                      | 47                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Trichlorofluoromethane               | --                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Vinyl chloride                       | 68                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Xylenes, total                       | 67                                   | 1U             | 1U             | 1U              | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             | 1U             |
| Methane                              | --                                   | 7,500          | 7,410          | 8,430           | 635            | 1,670          | 597            | 109            | 5,890          | 150            | 980            | 210            | 987            | 505            |

**Notes:**

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

VOCS = volatile organic compounds

mg/L = milligrams per liter

**Bold** = Detected

\* Screening criteria calculated to be protective of Kanawha River exposure pathways.

-- = Screening criteria not calculated

Table 5-1. Comparison of Analytical Results - 2017, 2012, and 2009 Data

2017 Pore Water Confirmation Sampling Report

UCC Institute Facility, Institute, West Virginia

|                     | Location<br>Sample ID<br>Sample Date | INS-0019<br>0019-PW-092717<br>9/27/2017 | INS-0019<br>0019-PW-120512<br>12/5/2012 | INS-0019<br>0019-PW-071009<br>7/10/2009 | INS-0293<br>0293-PW-092617<br>9/26/2017 | INS-0293<br>0293-PW-092617D<br>9/26/2017 | INS-0293<br>0293-PW-120412<br>12/4/2012 | INS-0297<br>0297-PW-092617<br>9/26/2017 | INS-0297<br>0297-PW-120512<br>12/5/2012 | INS-0298<br>0298-PW-092717<br>9/27/2017 | INS-0298<br>0298-PW-120412<br>12/4/2012 | INS-0300<br>0300-PW-092717<br>9/27/2017 | INS-0300<br>0300-PW-120512<br>12/5/2012 | INS-0301<br>0301-PW-092717<br>9/27/2017 | INS-0301<br>0301-PW-120512<br>12/5/2012 |
|---------------------|--------------------------------------|---|---|---|---|--|---|---|---|---|---|---|---|---|---|
| Analyte             | Pore Water Screening Levels*         |   |   |   |   |  |   |   |   |   |   |   |   |   |   |
| <b>VOCs (mg/L)</b>  |                                      |   |   |   |   |  |   |   |   |   |   |   |   |   |   |
| 1,4-Dichlorobenzene | 15                                   | 1 U                                     | 1 U                                     | <b>4.03</b>                             | 1 U                                     | 1 U                                      | <b>1.4</b>                              | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     |
| 2-Butanone          | 14000                                | 5 U                                     | <b>10.5 J</b>                           | 10 U                                    | 5 U                                     | 5 U                                      | <b>16 J</b>                             | 5 U                                     | <b>8.9 J</b>                            | 5 U                                     | <b>9.1 J</b>                            | 5 U                                     | <b>33 J</b>                             | 5 U                                     | <b>13.8 J</b>                           |
| Acetone             | 1500                                 | 5 U                                     | <b>65.5</b>                             | 25 U                                    | 5 U                                     | 5 U                                      | <b>83.2</b>                             | 5 U                                     | <b>27.2</b>                             | 5 U                                     | <b>36.7</b>                             | 5 U                                     | <b>129</b>                              | 5 U                                     | <b>68.1</b>                             |
| Benzene             | 130                                  | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                      | <b>4.11</b>                             | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     |
| Carbon disulfide    | 10.5                                 | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                      | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     |
| Chlorobenzene       | 64                                   | 1 U                                     | 1 U                                     | 1 U                                     | <b>38.8</b>                             | <b>42.2</b>                              | <b>49.1</b>                             | <b>3.3</b>                              | 1 U                                     | 1 U                                     | <b>1.94</b>                             | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     |
| Diethyl ether       | 825                                  | 10 U                                    | --                                      | --                                      | 10 U                                    | 10 U                                     | --                                      | 10 U                                    | --                                      | 10 U                                    | --                                      | 10 U                                    | --                                      | <b>27.6</b>                             | --                                      |
| Ethylbenzene        | 7                                    | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                      | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     |
| Naphthalene         | 193                                  | 1 U                                     | 1 U                                     | --                                      | 1 U                                     | 1 U                                      | <b>1.74</b>                             | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     |
| Toluene             | 10                                   | 1 U                                     | <b>1.19</b>                             | 1 U                                     | 1 U                                     | 1 U                                      | <b>12.5</b>                             | 1 U                                     | <b>3.72</b>                             | 1 U                                     | <b>7.12</b>                             | 1 U                                     | <b>1.15</b>                             | 1 U                                     | <b>1.52</b>                             |
| Xylenes, total      | 67                                   | 1 U                                     | 1 U                                     | 5 U                                     | 1 U                                     | 1 U                                      | <b>4.21</b>                             | 1 U                                     | <b>1.62</b>                             | 1 U                                     | <b>2.77</b>                             | 1 U                                     | <b>1.04</b>                             | 1 U                                     | <b>1.1</b>                              |
| Methane             | --                                   | 7,500                                   | --                                      | --                                      | <b>7,410</b>                            | <b>8,430</b>                             | --                                      | 635                                     | --                                      | <b>1,670</b>                            | --                                      | 597                                     | --                                      | 109                                     | --                                      |

**Notes:**

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

VOCs = volatile organic compounds

mg/L = milligrams per liter

**Bold** = Detected

\* Screening criteria calculated to be protective of Kanawha River exposure pathways.

-- = Not available / not analyzed

Table 5-1. Comparison of Analytical Results - 2017, 2012, and 2009 Data

2017 Pore Water Confirmation Sampling Report

UCC Institute Facility, Institute, West Virginia

|                     | Location<br>Sample ID<br>Sample Date | INS-0305<br>0305-PW-092717<br>9/27/2017 | INS-0305<br>0305-PW-120612<br>12/6/2012 | INS-0306<br>0306-PW-092817<br>9/28/2017 | INS-0306<br>0306-PW-120612<br>12/6/2012 | INS-0309<br>0309-PW-092817<br>9/28/2017 | INS-0309<br>0309-PW-120612<br>12/6/2012 | INS-0310<br>0310-PW-092817<br>9/28/2017 | INS-0310<br>0310-PW-120712<br>12/7/2012 | INS-0311<br>0311-PW-092817<br>9/28/2017 | INS-0311<br>0311-PW-120612<br>12/6/2012 | INS-0311D<br>0311-PW-120612D<br>12/6/2012<br>Duplicate | INS-0315<br>0315-PW-092817<br>9/28/2017 | INS-0315<br>0315-PW-120712<br>12/7/2012 | INS-0020<br>0020-PW-071009<br>7/10/2009 |
|---------------------|--------------------------------------|---|---|---|---|---|---|---|---|---|---|--|---|---|---|
| Analyte             | Pore Water Screening Levels*         |   |   |   |   |   |   |   |   |   |   |  |   |   |   |
| <b>VOCs (mg/L)</b>  |                                      |   |   |   |   |   |   |   |   |   |   |  |   |   |   |
| 1,4-Dichlorobenzene | 15                                   | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U  | 1 U                                     | 1 U                                     | 1.79                                    |
| 2-Butanone          | 14000                                | 5 U                                     | 5 U                                     | 5 U                                     | 5 U                                     | 5 U                                     | 5 U                                     | 5 U                                     | 5 U                                     | 5 U                                     | 5 U                                     | 5 U  | 5 U                                     | 21.1                                    | 10 U                                    |
| Acetone             | 1500                                 | 5 U                                     | 5.64                                    | 5 U                                     | 5 U                                     | 5 U                                     | 5.5                                     | 5 U                                     | 17.9                                    | 5 U                                     | 5 U                                     | 5 U  | 5 U                                     | 136                                     | 25 U                                    |
| Benzene             | 130                                  | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U  | 1 U                                     | 1 U                                     | 1 U                                     |
| Carbon disulfide    | 10.5                                 | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U  | 1 U                                     | 1.9                                     |   |
| Chlorobenzene       | 64                                   | 1 U                                     | 1 U                                     | 2.4                                     | 4.53                                    | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U  | 1 U                                     | 1 U                                     | 1 U                                     |
| Diethyl ether       | 825                                  | 41.3                                    | --                                      | 27.1                                    | --                                      | 81.5                                    | --                                      | 16.7                                    | --                                      | 59.1                                    | --                                      | --   | 64.0                                    | --                                      | --                                      |
| Ethylbenzene        | 7                                    | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U  | 1 U                                     | 1 U                                     | 1 U                                     |
| Naphthalene         | 193                                  | 1 U                                     | 1.23                                    | 1.2                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 1 U                                     | 31.4                                    | 1.56                                    | 1.79   | 1 U                                     | 1 U                                     | --                                      |
| Toluene             | 10                                   | 1 U                                     | 3.4                                     | 1 U                                     | 1.36                                    | 1 U                                     | 2.87                                    | 1 U                                     | 2.86                                    | 1 U                                     | 3.24                                    | 2.83   | 1 U                                     | 1.7                                     | 1 U                                     |
| Xylenes, total      | 67                                   | 1 U                                     | 2.07                                    | 1 U                                     | 1 U                                     | 1 U                                     | 1.68                                    | 1 U                                     | 1 U                                     | 1 U                                     | 1.88                                    | 1.66   | 1 U                                     | 2.24                                    | 5 U                                     |
| Methane             | --                                   | 5,890                                   | --                                      | 150                                     | --                                      | 980                                     | --                                      | 210                                     | --                                      | 987                                     | --                                      | --   | 505                                     | --                                      | --                                      |

**Notes:**

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

VOCs = volatile organic compounds

mg/L = milligrams per liter

**Bold** = Detected

\* Screening criteria calculated to be protective of Kanawha River exposure pathways.

-- = Not available / not analyzed

# Figures

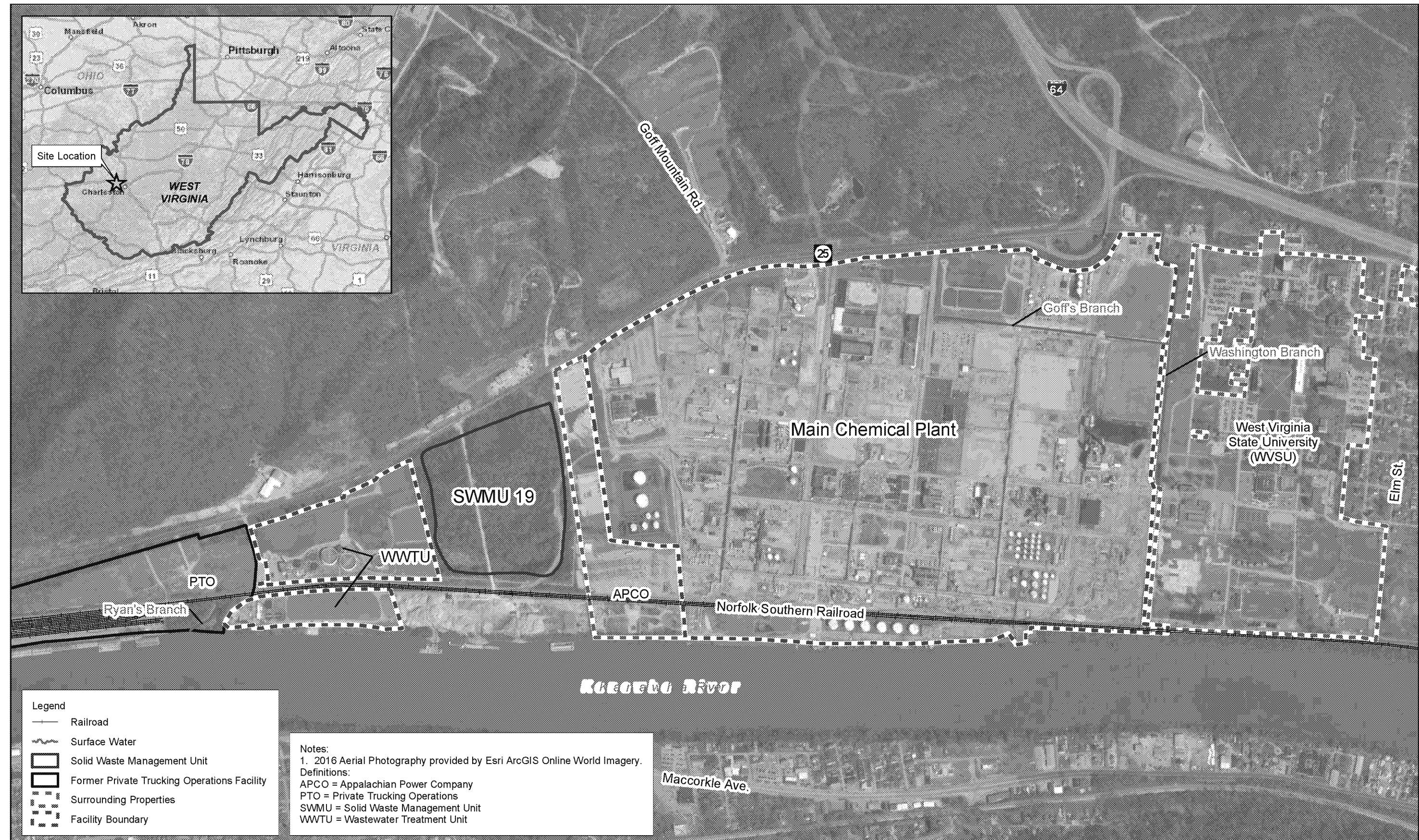
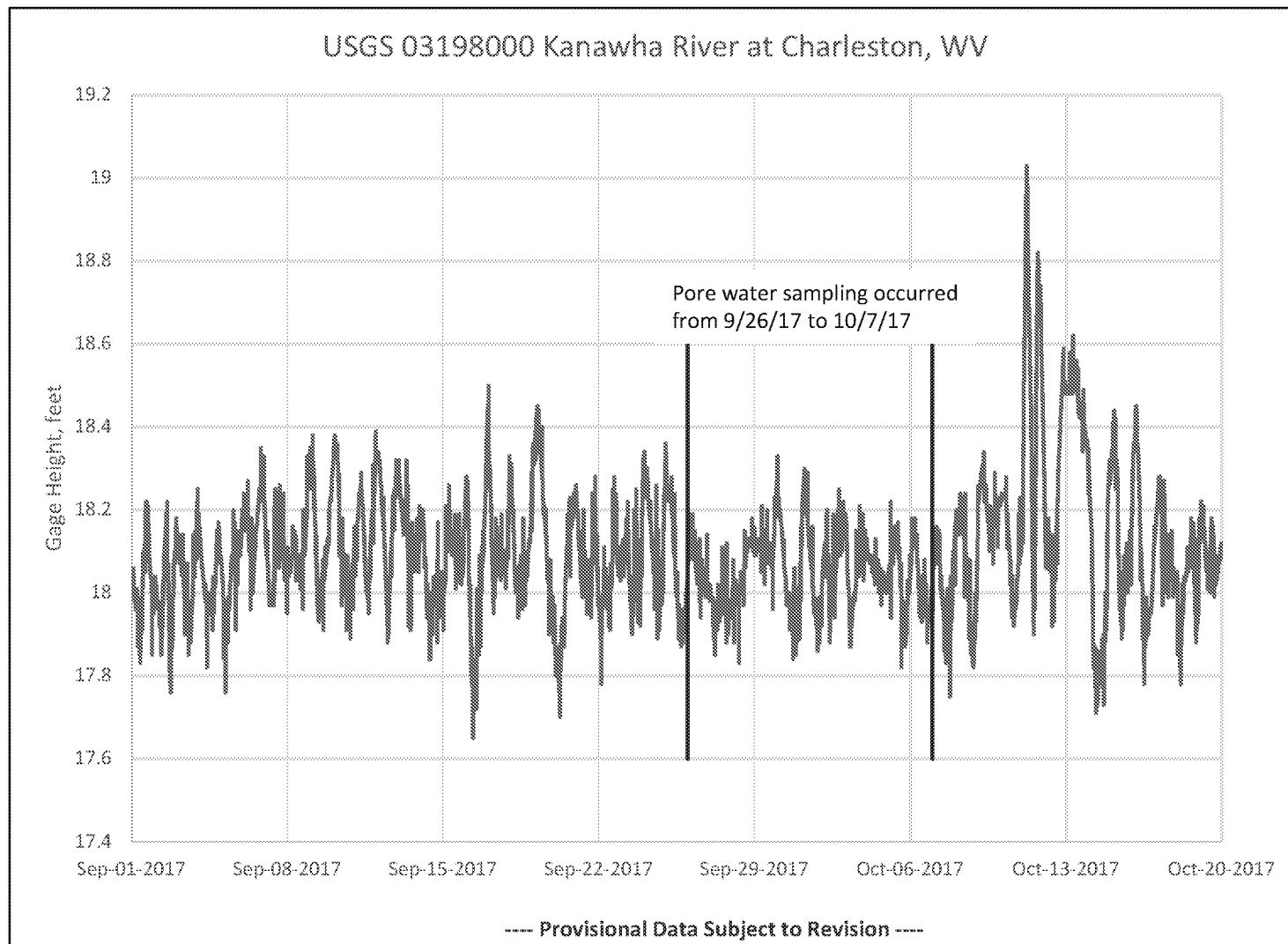


Figure 1-1  
Site Location and Neighboring Properties Map  
2017 Pore Water Characterization Report  
Union Carbide Corporation Institute Facility  
Institute, West Virginia



Figure 1-2  
Pore Water Resampling Locations  
2017 Pore Water Characterization Report  
Union Carbide Corporation Institute Facility  
Institute, West Virginia

ch2m



Note: Hydrograph data obtained from USGS. Website: <https://waterdata.usgs.gov>

**Figure 4-1**  
**Kanawha River Gage Hydrograph – 2017**  
*Pore Water Characterization Report*  
*South Charleston, West Virginia*

ch2m

Figure 4-2  
Surface Water vs Pore Water ORP

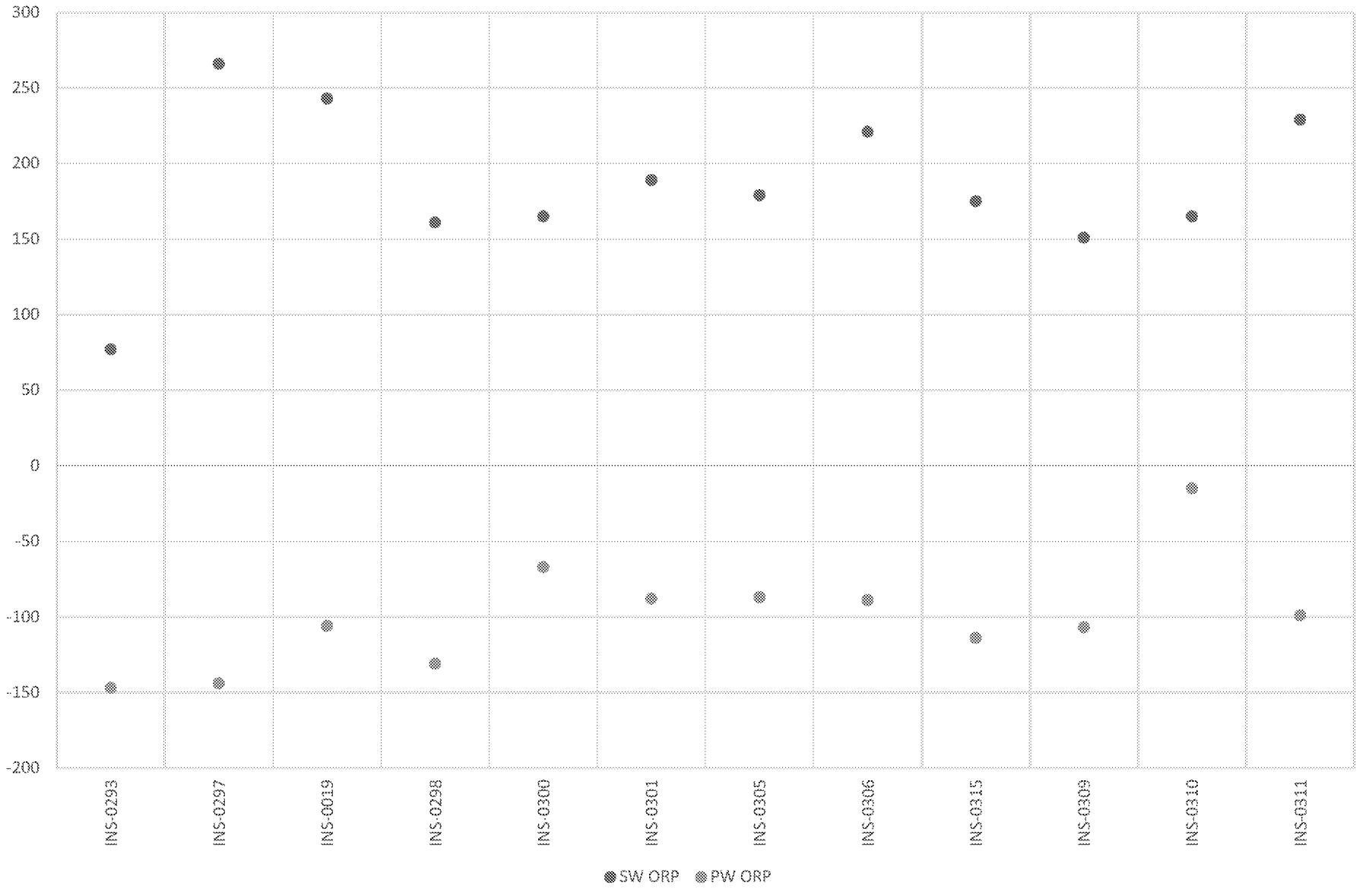


Figure 4-3  
Suface Water vs Pore Water TDS

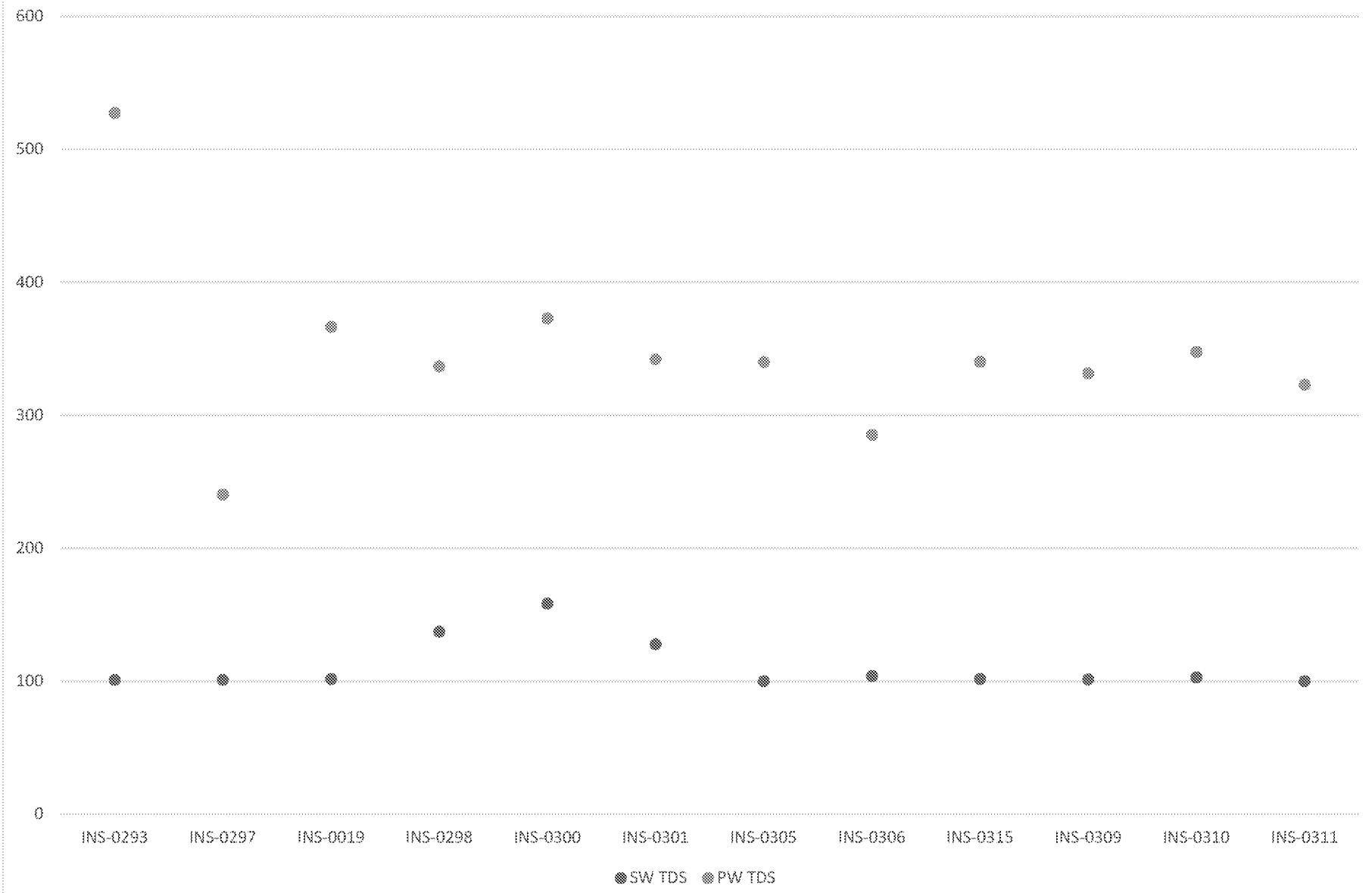




Figure 4-4  
Pore Water Methane Results  
2017 Pore Water Characterization Report  
Union Carbide Corporation Institute Facility  
Institute, West Virginia

# Appendix A

## Data Quality Evaluation

# Data Quality Evaluation, 2017 Pore Water Investigation, Institute Facility, Institute, West Virginia

PREPARED FOR: Union Carbide Corporation (UCC)  
PREPARED BY: CH2M HILL Inc. (CH2M)  
DATE: February 2018

## Introduction

This data quality evaluation (DQE) report summarizes the data quality of analytical results for pore water samples collected from the UCC Institute Facility in Institute, West Virginia. CH2M collected samples September 26 through September 28, 2017. Guidance for this DQE report came from the *Dow WVO Quality Assurance Project Plan (May 2012)* (Dow WVO QAPP), *U.S. Environmental Protection Agency (USEPA) National Functional Guidelines for Organic Superfund Methods Data Review* (USEPA, January 2017), and individual method requirements.

The analytical results were evaluated using the criteria of precision, accuracy, representativeness, comparability, and completeness (PARCC) as presented in the Dow WVO QAPP. This report is intended as a general data quality assessment designed to summarize data issues.

## Analytical Data

This DQE report covers 12 pore water samples, 1 field duplicate (FD), 1 matrix spike (MS)/matrix spike duplicate (MSD), 1 equipment blank (EB), and 2 trip blanks (TB). The samples were reported in two sample delivery groups identified as L17091702 and L17100037. The samples were collected and delivered to Microbac Laboratories (MBLM) in Marietta, Ohio. The samples were analyzed by the methods listed in Table 1.

**Table 1. Analytical Parameters**

*2017 Pore Water Investigation, Institute, West Virginia*

| Parameter                  | Method  | Laboratory |
|----------------------------|---------|------------|
| Volatile Organic Compounds | SW8260B | MBLM       |
| Methane                    | RSK-175 | MBLM       |

The sample delivery groups were assessed by reviewing the chain-of-custody documentation, holding time compliance, initial and continuing calibration criteria, method blanks/field blanks, laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) recoveries and precision, MS/MSD recoveries and precision, surrogate spike recoveries, internal standard recoveries, and the required quality control (QC) samples at the specified frequencies.

Data flags were assigned according to the Dow WVO QAPP. Multiple flags are routinely applied to specific sample method/matrix/analyte combinations, but there will only be one final flag. A final flag is applied to the data and is the most conservative of the applied validation flags. The final flag also includes matrix and blank sample impacts.

The data flags are those listed in the Dow WVO QAPP and are defined below:

- J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- R = The sample result was rejected due to serious deficiencies in the ability to analyze the sample and meet the QC criteria. The presence or absence of the analyte could not be verified.
- U = The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- B = The analyte was detected in the blank as well as the samples.
- K = The analyte was positively identified, but the associated numerical value may be biased high.
- L = The analyte was positively identified, but the associated numerical value may be biased low.
- UL = The analyte was analyzed for but was not detected. The quantitation limit may be biased low.

## Findings

The overall summaries of the data validation are contained in the following sections. No data was qualified during validation.

### Holding Time/Preservation

All acceptance criteria were met.

### Calibration

Initial and continuing calibration analyses were performed as required by the method, and all acceptance criteria were met.

### Method Blanks

Method blanks were analyzed at the required frequency and were free of contamination.

### Laboratory Control Samples

LCS/LCSDs were analyzed as required, and accuracy and precision criteria were met.

### Internal Standards

Internal standards were added to the samples, and acceptance criteria were met.

### Surrogates

Surrogates were added to the samples, and acceptance criteria were met.

### Matrix Spike Samples

MS/MSDs were analyzed as required, and accuracy and precision criteria were met.

### Field Blanks

EBs and TBs were collected, analyzed, and were free of contamination.

## Field Duplicates

A FD was collected, analyzed, and all precision criteria were met.

## Chain-of-Custody

Required procedures were followed and generally free of errors.

## Overall Assessment

The goal of this assessment is to demonstrate that a sufficient number of representative samples were collected and the resulting analytical data can be used to support the decision-making process. The following summary highlights the PARCC findings for the above-defined events:

- Precision of the data was verified by reviewing the laboratory data quality indicators that include FD, LCS/LCSD, and MS/MSD relative percent differences (RPDs). Precision was acceptable.
- Accuracy of the data was verified by reviewing the calibration data, LCS/LCSD, MS/MSD, internal standards, and surrogate standard recoveries, as well as the evaluation of calibration/method/field blank data. Accuracy was acceptable. All blanks were free of contamination.
- Representativeness of the data was verified through the sample's collection, storage, and preservation procedures and the verification of holding time compliance. The laboratory did not note any issues related to sample preservation or storage of the samples. The data were reported from analyses within the USEPA-recommended holding time.
- Comparability of the data was verified using standard USEPA analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid. The completeness goal of 90% was met for all method/analytes combinations.

## References

CH2M HILL Inc. (CH2M). 2012. *Dow WVO Quality Assurance Project Plan*. Prepared for Union Carbide Corporation. May.

U.S. Environmental Protection Agency (USEPA). 2017. *USEPA National Functional Guidelines for Organic Superfund Methods Data Review*. OLEM 9355.0-136. EPA-540-R-2017-002.

## Appendix B

# Laboratory Analytical Reports

Laboratory Report Number: L17091702 (Revised)

Revised report to change the Sample ID from TB01-092717 should be INS-TB01-092717.

Shane Lowe  
CH2MHILL, Inc  
1034 South Brentwood Blvd, Suite 2300  
Richmond Heights, MO 63117

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac's Ohio Valley Division (OVD). If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed below.

Laboratory Contact:  
Michelle Taylor – Client Services Specialist  
(740) 373-4071  
[Michelle.Taylor@microbac.com](mailto:Michelle.Taylor@microbac.com)

*I certify that all test results meet all of the requirements of the accrediting authority listed below. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories. The reported results are related only to the samples analyzed as received.*

This report was certified on November 02 2017



Leslie Bucina – Managing Director

State of Origin: WV  
Accrediting Authority: Department of Environmental Protection ID:361  
QAPP: Dow WVO QAPP - 2012 Update



Microbac Laboratories \* Ohio Valley Division  
158 Starlite Drive, Marietta, OH 45750 \* T: (740) 373-4071 F: (740) 373-4835 \* [www.microbac.com](http://www.microbac.com)

## Record of Sample Receipt and Inspection

### Comments/Discrepancies

This is the record of the shipment conditions and the inspection records for the samples received and reported as a sample delivery group (SDG). All of the samples were inspected and observed to conform to our receipt policies, except as noted below.

The following discrepancies were noted:

| Discrepancy  | Resolution |
|--|------------|
| Sample ID: 0293-PW-092617. All 3 voa vials received w/headspace >6mm Please proceed. MRT and RSK vials 2 of 3 received w/headspace >6mm. BRG |            |
| Sample ID: 0293-PW-092617D. 1 of 3 RSK vials received w/headspace >6mm. BRG  |            |
| Sample ID: 0297-PW-092617. 1 of 3 RSK vials received w/headspace >6mm. BRG   |            |
| Sample ID: 0297-PW-092617SD. 2 of 3 RSK vials received w/headspace >6mm. BRG   |            |
| Sample ID: 0019-PW-092717. 2 of 3 RSK vials received w/headspace >6mm. BRG   |            |
| Sample ID: 0298-PW-092717. 1 of 3 RSK vials received w/headspace >6mm. BRG   |            |

### Coolers

| Cooler # | Temperature Gun | Temperature | COC # | Airbill # | Temp Required? |
|----------|-----------------|-------------|-------|-----------|----------------|
| 00114619 | I               | 1.0         |       |           | X              |
| 00114582 | I               | 2.0         |       |           | X              |
| 0019740  | I               | 1.0         |       |           | X              |

### Inspection Checklist

| #  | Question   | Result |
|----|--|--------|
| 1  | Were shipping coolers sealed?                              | Yes    |
| 2  | Were custody seals intact?                                 | Yes    |
| 3  | Were cooler temperatures in range of 0-6?                  | Yes    |
| 4  | Was ice present?   | Yes    |
| 5  | Were COC's received/information complete/signed and dated? | Yes    |
| 6  | Were sample containers intact and match COC?               | Yes    |
| 7  | Were sample labels intact and match COC?                   | Yes    |
| 8  | Were the correct containers and volumes received?          | Yes    |
| 9  | Were samples received within EPA hold times?               | Yes    |
| 10 | Were correct preservatives used? (water only)              | Yes    |
| 11 | Were pH ranges acceptable? (voa's excluded)                | NA     |
| 12 | Were VOA samples free of headspace (less than 6mm)?        | No     |

# Microbac

**Lab Report #:** L17091702  
**Lab Project #:** 2736.134  
**Project Name:** SC-Institute Area 3  
**Lab Contact:** Michelle Taylor

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Page 3



Lab Report #: L17091702

Lab Project #: 2736.134

Project Name: SC-Institute Area 3

Lab Contact: Michelle Taylor

**Samples Received**

| Client ID        | Laboratory ID | Date Collected   | Date Received    |
|------------------|---------------|------------------|------------------|
| 0293-PW-092617   | L17091702-01  | 09/26/2017 14:25 | 09/28/2017 14:30 |
| 0293-PW-092617D  | L17091702-02  | 09/26/2017 14:30 | 09/28/2017 14:30 |
| 0297-PW-092617   | L17091702-03  | 09/26/2017 15:40 | 09/28/2017 14:30 |
| 0297-PW-092617MS | L17091702-04  | 09/26/2017 15:40 | 09/28/2017 14:30 |
| 0297-PW-092617SD | L17091702-05  | 09/26/2017 15:40 | 09/28/2017 14:30 |
| 0019-PW-092717   | L17091702-06  | 09/27/2017 10:45 | 09/28/2017 14:30 |
| 0298-PW-092717   | L17091702-07  | 09/27/2017 11:40 | 09/28/2017 14:30 |
| 0300-PW-092717   | L17091702-08  | 09/27/2017 14:00 | 09/28/2017 14:30 |
| 0301-PW-092717   | L17091702-09  | 09/27/2017 15:55 | 09/28/2017 14:30 |
| 0305-PW-092717   | L17091702-10  | 09/27/2017 16:55 | 09/28/2017 14:30 |
| INS-TB01-092717  | L17091702-11  | 09/27/2017 18:15 | 09/28/2017 14:30 |

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**Login Number:** L17091702

**Department:** Volatiles

**Analyst:** Heather Fairchild

## METHOD

**Preparation** SW-846 5030B/5030C/5035A

**Analysis** SW-846 8260B

## HOLDING TIMES

**Sample Preparation:** All holding times were met.

**Sample Analysis:** All holding times were met.

## PREPARATION

Sample preparation proceeded normally.

## CALIBRATION

**Initial Calibration:** For all compounds that yielded a %RSD greater than 15%, linear or higher order equations were applied. All acceptance criteria were met.

**Alternate Source Standards:** All acceptance criteria were met.

**Continuing Calibration and Tune:** All acceptance criteria were met.

## BATCH QA/QC

**Method Blank:** All acceptance criteria were met.

**Laboratory Control Sample:** All acceptance criteria were met.

**Matrix Spikes:** All acceptance criteria were met.

## SAMPLES

**Internal Standards:** All acceptance criteria were met.

**Surrogates:** All acceptance criteria were met.

**Other:** None.

### **Manual Integration Reason Codes**

**Reason #1: Data System Fails to Select Correct Peak.** In some cases the chromatography system selects and integrates the 'wrong peak'. In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

**Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak.** This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low areacounts for the target compound.

**Reason #3: Improperly Integrated Isomers and/or coeluting compounds.** This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

**Reason #4: System Establishes Incorrect Baseline.** There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and should be corrected via manual procedures.

**Reason #5: Miscellaneous.** Other situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the laboratory management. If the form of manual integration is not clearly covered by these four cases, then review and approval by the Managing Director or the QAO will be required.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

**Narrative ID:** 130300

**Approved By:** Sarah Vandenberg

*Sarah Vandenberg*



**Login Number:** L17091702  
**Department:** Volatiles - GC  
**Analyst:** Heather Fairchild

## Analysis RSK-175

### HOLDING TIMES

**Sample Preparation:** All holding times were met.

**Sample Analysis:** All holding times were met.

### PREPARATION

Sample preparation proceeded normally.

### CALIBRATION

**Initial Calibration:** For all compounds that yielded a %RSD greater than 15%, linear or higher order equations were applied. All acceptance criteria were met.

**Alternate Source Standards:** All acceptance criteria were met.

**Continuing Calibration and Tune:** All acceptance criteria were met.

### BATCH QA/QC

**Method Blank:** All acceptance criteria were met.

**Laboratory Control Sample:** All acceptance criteria were met.

**Matrix Spikes/Sample Duplicates:** The MS/MSD results were not associated with this sample delivery group (SDG), due to insufficient volume of sample. Microbac Laboratories recommends site specific MS/MSD samples to avoid possible data qualifications.

### SAMPLES

**Samples:** Samples 01, 02, 03, 04, 05, 06, 07, and 10 required dilution analyses.

## **Manual Integration Reason Codes**

**Reason #1: Data System Fails to Select Correct Peak** In some cases the chromatography system selects and integrates the 'wrong peak'. In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

**Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak** This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low area counts for the target compound.

**Reason #3: Improperly Integrated Isomers and/or coeluting compounds.** This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

**Reason #4: System Establishes Incorrect Baseline** There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and should be corrected via manual procedures.

**Reason #5: Miscellaneous** Other situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the laboratory management. If the form of manual integration is not clearly covered by these four cases, then review and approval by the Laboratory Director or the QA/QC Supervisor will be required.

**Narrative ID:** 130127

**Approved By:** Sarah Vandenberg

*Sarah Vandenberg*

## Certificate of Analysis

Sample #: L17091702-01

PrePrep Method: N/A

Instrument: HPMS8

Client ID: 0293-PW-092617

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 09/13/2017 19:41

Workgroup #: WG632680

Analyst: HRF

Run Date: 10/05/2017 15:02

Collect Date: 09/26/2017 14:25

Dilution: 1

File ID: 8M421956

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        | U    | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 | 38.8   |      | 1.00 | 0.125 |
| Chloroform                | 67-66-3  |        | U    | 1.00 | 0.125 |
| Dibromochloromethane      | 124-48-1 |        | U    | 1.00 | 0.250 |
| Dichlorodifluoromethane   | 75-71-8  |        | U    | 1.00 | 0.250 |
| Chloromethane             | 74-87-3  |        | U    | 1.00 | 0.500 |
| cis-1,2-Dichloroethene    | 156-59-2 |        | U    | 1.00 | 0.250 |
| Diethyl ether             | 60-29-7  |        | U    | 10.0 | 5.00  |
| Ethylbenzene              | 100-41-4 |        | U    | 1.00 | 0.250 |
| Methylene chloride        | 75-09-2  |        | U    | 1.00 | 0.250 |
| Naphthalene               | 91-20-3  |        | U    | 1.00 | 0.200 |
| Styrene                   | 100-42-5 |        | U    | 1.00 | 0.125 |
| Tetrachloroethene         | 127-18-4 |        | U    | 1.00 | 0.250 |
| Toluene                   | 108-88-3 |        | U    | 1.00 | 0.250 |
| trans-1,2-Dichloroethene  | 156-60-5 |        | U    | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                | CAS #  | Result      | Qual        | RL   | MDL   |
|------------------------|--|-------------|-------------|------|-------|
| Trichloroethene        | 79-01-6  |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4  |             | U           | 1.00 | 0.250 |
| Vinyl chloride         | 75-01-4  |             | U           | 1.00 | 0.250 |
| Xylenes                | 1330-20-7  |             | U           | 1.00 | 0.500 |
| Surrogate              | Recovery   | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4  | 91.8   | 70          | 120         |      |       |
| 4-Bromofluorobenzene   | 99.3   | 75          | 120         |      |       |
| Dibromofluoromethane   | 91.4   | 85          | 115         |      |       |
| Toluene-d8             | 94.8   | 85          | 120         |      |       |
| U                      | Not detected at or above the reporting limit (RL). |             |             |      |       |

Sample #: L17091702-01

PrePrep Method: N/A

Instrument: HP16

Client ID: 0293-PW-092617

Prep Method: 5021

Prep Date: N/A

Matrix: Water

Analytical Method: RSK175

Cal Date: 07/19/2017 11:32

Workgroup #: WG632131

Analyst: HRF

Run Date: 10/02/2017 16:49

Collect Date: 09/26/2017 14:25

Dilution: 10

File ID: 16G53528

Sample Tag: DL01

Units: ug/L

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 7410   |      | 50.0 | 10.0 |

Sample #: L17091702-02

PrePrep Method: N/A

Instrument: HPMS8

Client ID: 0293-PW-092617D

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 09/13/2017 19:41

Workgroup #: WG632680

Analyst: HRF

Run Date: 10/05/2017 15:33

Collect Date: 09/26/2017 14:30

Dilution: 1

File ID: 8M421957

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |

## Certificate of Analysis

| Analyte                  | CAS #     | Result      | Qual        | RL   | MDL   |
|--------------------------|-----------|-------------|-------------|------|-------|
| 4-Methyl-2-pentanone     | 108-10-1  |             | U           | 5.00 | 2.50  |
| Acetone                  | 67-64-1   |             | U           | 5.00 | 2.50  |
| 2-Hexanone               | 591-78-6  |             | U           | 5.00 | 2.50  |
| Benzene                  | 71-43-2   |             | U           | 1.00 | 0.125 |
| Bromodichloromethane     | 75-27-4   |             | U           | 1.00 | 0.250 |
| Bromomethane             | 74-83-9   |             | U           | 1.00 | 0.500 |
| Carbon disulfide         | 75-15-0   |             | U           | 1.00 | 0.500 |
| Carbon tetrachloride     | 56-23-5   |             | U           | 1.00 | 0.250 |
| Chlorobenzene            | 108-90-7  | 42.2        |             | 1.00 | 0.125 |
| Chloroform               | 67-66-3   |             | U           | 1.00 | 0.125 |
| Dibromochloromethane     | 124-48-1  |             | U           | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8   |             | U           | 1.00 | 0.250 |
| Chloromethane            | 74-87-3   |             | U           | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2  |             | U           | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7   |             | U           | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4  |             | U           | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2   |             | U           | 1.00 | 0.250 |
| Naphthalene              | 91-20-3   |             | U           | 1.00 | 0.200 |
| Styrene                  | 100-42-5  |             | U           | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4  |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3  |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5  |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6   |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4   |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4   |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7 |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery  | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 92.8      | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 96.1      | 75          | 120         |      |       |
| Dibromofluoromethane     | 92.3      | 85          | 115         |      |       |
| Toluene-d8               | 96.7      | 85          | 120         |      |       |

U Not detected at or above the reporting limit (RL).

Sample #: L17091702-02

PrePrep Method: N/A

Instrument: HP16

Client ID: 0293-PW-092617D

Prep Method: 5021

Prep Date: N/A

Matrix: Water

Analytical Method: RSK175

Cal Date: 07/19/2017 11:32

Workgroup #: WG632131

Analyst: HRF

Run Date: 10/02/2017 17:01

Collect Date: 09/26/2017 14:30

Dilution: 10

File ID: 16G53529

Sample Tag: DL01

Units: ug/L

## Certificate of Analysis

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 8430   |      | 50.0 | 10.0 |

Sample #: L17091702-03  
 Client ID: 0297-PW-092617  
 Matrix: Water  
 Workgroup #: WG632680  
 Collect Date: 09/26/2017 15:40  
 Sample Tag: 01

PrePrep Method: N/A  
 Prep Method: 5030B/5030C/5035A  
 Analytical Method: 8260B  
 Analyst: HRF  
 Dilution: 1  
 Units: ug/L

Instrument: HPMS8  
 Prep Date: N/A  
 Cal Date: 09/13/2017 19:41  
 Run Date: 10/05/2017 14:02  
 File ID: 8M421954

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        | U    | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 | 3.30   |      | 1.00 | 0.125 |
| Chloroform                | 67-66-3  |        | U    | 1.00 | 0.125 |
| Dibromochloromethane      | 124-48-1 |        | U    | 1.00 | 0.250 |
| Dichlorodifluoromethane   | 75-71-8  |        | U    | 1.00 | 0.250 |
| Chloromethane             | 74-87-3  |        | U    | 1.00 | 0.500 |
| cis-1,2-Dichloroethene    | 156-59-2 |        | U    | 1.00 | 0.250 |
| Diethyl ether             | 60-29-7  |        | U    | 10.0 | 5.00  |
| Ethylbenzene              | 100-41-4 |        | U    | 1.00 | 0.250 |
| Methylene chloride        | 75-09-2  |        | U    | 1.00 | 0.250 |
| Naphthalene               | 91-20-3  |        | U    | 1.00 | 0.200 |
| Styrene                   | 100-42-5 |        | U    | 1.00 | 0.125 |

## Certificate of Analysis

| Analyte                  | CAS #  | Result      | Qual        | RL   | MDL   |
|--------------------------|--|-------------|-------------|------|-------|
| Tetrachloroethene        | 127-18-4   |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3   |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5   |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6  |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4  |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4  |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7  |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery   | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 94.6   | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 97.6   | 75          | 120         |      |       |
| Dibromofluoromethane     | 93.9   | 85          | 115         |      |       |
| Toluene-d8               | 96.6   | 85          | 120         |      |       |
| U                        | Not detected at or above the reporting limit (RL). |             |             |      |       |

Sample #: L17091702-03      PrePrep Method: N/A      Instrument: HP16  
 Client ID: 0297-PW-092617      Prep Method: 5021      Prep Date: N/A  
 Matrix: Water      Analytical Method: RSK175      Cal Date: 07/19/2017 11:32  
 Workgroup #: WG631960      Analyst: HRF      Run Date: 09/29/2017 18:49  
 Collect Date: 09/26/2017 15:40      Dilution: 5      File ID: 16G53510  
 Sample Tag: DL01      Units: ug/L

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 635    |      | 25.0 | 5.00 |

Sample #: L17091702-04      PrePrep Method: N/A      Instrument: HPMS8  
 Client ID: 0297-PW-092617MS      Prep Method: 5030B/5030C/5035A      Prep Date: N/A  
 Matrix: Water      Analytical Method: 8260B      Cal Date: 09/13/2017 19:41  
 Workgroup #: WG632680      Analyst: HRF      Run Date: 10/05/2017 12:31  
 Collect Date: 09/26/2017 15:40      Dilution: 1      File ID: 8M421951  
 Sample Tag: 01      Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  | 20.2   |      | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  | 19.6   |      | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  | 18.0   |      | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  | 18.1   |      | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 | 19.4   |      | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  | 19.1   |      | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  | 20.2   |      | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 | 19.3   |      | 1.00 | 0.125 |

## Certificate of Analysis

| Analyte                  | CAS #     | Result      | Qual        | RL   | MDL   |
|--------------------------|-----------|-------------|-------------|------|-------|
| 1,3,5-Trimethylbenzene   | 108-67-8  | 19.5        |             | 1.00 | 0.250 |
| 1,3-Dichlorobenzene      | 541-73-1  | 19.2        |             | 1.00 | 0.250 |
| 2-Butanone               | 78-93-3   | 20.3        |             | 5.00 | 2.50  |
| 4-Methyl-2-pentanone     | 108-10-1  | 19.9        |             | 5.00 | 2.50  |
| Acetone                  | 67-64-1   | 20.1        |             | 5.00 | 2.50  |
| 2-Hexanone               | 591-78-6  | 19.5        |             | 5.00 | 2.50  |
| Benzene                  | 71-43-2   | 19.5        |             | 1.00 | 0.125 |
| Bromodichloromethane     | 75-27-4   | 19.0        |             | 1.00 | 0.250 |
| Bromomethane             | 74-83-9   | 14.5        |             | 1.00 | 0.500 |
| Carbon disulfide         | 75-15-0   | 16.9        |             | 1.00 | 0.500 |
| Carbon tetrachloride     | 56-23-5   | 19.0        |             | 1.00 | 0.250 |
| Chlorobenzene            | 108-90-7  | 21.5        |             | 1.00 | 0.125 |
| Chloroform               | 67-66-3   | 18.4        |             | 1.00 | 0.125 |
| Dibromochloromethane     | 124-48-1  | 19.4        |             | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8   | 17.8        |             | 1.00 | 0.250 |
| Chloromethane            | 74-87-3   | 18.6        |             | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2  | 18.6        |             | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7   | 95.4        |             | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4  | 18.5        |             | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2   | 19.0        |             | 1.00 | 0.250 |
| Naphthalene              | 91-20-3   | 19.9        |             | 1.00 | 0.200 |
| Styrene                  | 100-42-5  | 20.2        |             | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4  | 17.6        |             | 1.00 | 0.250 |
| Toluene                  | 108-88-3  | 18.9        |             | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5  | 18.5        |             | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6   | 20.4        |             | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4   | 18.8        |             | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4   | 23.2        |             | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7 | 57.7        |             | 1.00 | 0.500 |
| Surrogate                | Recovery  | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 93.2      | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 98.6      | 75          | 120         |      |       |
| Dibromofluoromethane     | 93.3      | 85          | 115         |      |       |
| Toluene-d8               | 95.4      | 85          | 120         |      |       |

## Certificate of Analysis

Sample #: L17091702-04  
 Client ID: 0297-PW-092617MS  
 Matrix: Water  
 Workgroup #: WG631960  
 Collect Date: 09/26/2017 15:40  
 Sample Tag: DL01

PrePrep Method: N/A  
 Prep Method: 5021  
 Analytical Method: RSK175  
 Analyst: HRF  
 Dilution: 5  
 Units: ug/L

Instrument: HP16  
 Prep Date: N/A  
 Cal Date: 07/19/2017 11:32  
 Run Date: 09/29/2017 18:25  
 File ID: 16G53508

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 1270   |      | 25.0 | 5.00 |

Sample #: L17091702-05  
 Client ID: 0297-PW-092617SD  
 Matrix: Water  
 Workgroup #: WG632680  
 Collect Date: 09/26/2017 15:40  
 Sample Tag: 01

PrePrep Method: N/A  
 Prep Method: 5030B/5030C/5035A  
 Analytical Method: 8260B  
 Analyst: HRF  
 Dilution: 1  
 Units: ug/L

Instrument: HPMS8  
 Prep Date: N/A  
 Cal Date: 09/13/2017 19:41  
 Run Date: 10/05/2017 13:02  
 File ID: 8M421952

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  | 19.1   |      | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  | 19.1   |      | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  | 18.1   |      | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  | 17.7   |      | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 | 19.1   |      | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  | 19.2   |      | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  | 20.3   |      | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 | 19.2   |      | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 | 19.4   |      | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 | 18.8   |      | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  | 18.6   |      | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 | 17.4   |      | 5.00 | 2.50  |
| Acetone                   | 67-64-1  | 19.1   |      | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 | 17.6   |      | 5.00 | 2.50  |
| Benzene                   | 71-43-2  | 19.5   |      | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  | 18.9   |      | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  | 14.2   |      | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  | 16.0   |      | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  | 18.6   |      | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 | 21.2   |      | 1.00 | 0.125 |
| Chloroform                | 67-66-3  | 18.4   |      | 1.00 | 0.125 |
| Dibromochloromethane      | 124-48-1 | 18.7   |      | 1.00 | 0.250 |
| Dichlorodifluoromethane   | 75-71-8  | 16.3   |      | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                  | CAS #     | Result      | Qual        | RL   | MDL   |
|--------------------------|-----------|-------------|-------------|------|-------|
| Chloromethane            | 74-87-3   | 17.3        |             | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2  | 18.7        |             | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7   | 90.3        |             | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4  | 18.7        |             | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2   | 19.1        |             | 1.00 | 0.250 |
| Naphthalene              | 91-20-3   | 19.3        |             | 1.00 | 0.200 |
| Styrene                  | 100-42-5  | 20.4        |             | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4  | 17.6        |             | 1.00 | 0.250 |
| Toluene                  | 108-88-3  | 18.7        |             | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5  | 18.5        |             | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6   | 20.1        |             | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4   | 17.8        |             | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4   | 22.1        |             | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7 | 57.3        |             | 1.00 | 0.500 |
| Surrogate                | Recovery  | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 91.7      | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 97.5      | 75          | 120         |      |       |
| Dibromofluoromethane     | 94.2      | 85          | 115         |      |       |
| Toluene-d8               | 95.1      | 85          | 120         |      |       |

Sample #: L17091702-05

PrePrep Method: N/A

Instrument: HP16

Client ID: 0297-PW-092617SD

Prep Method: 5021

Prep Date: N/A

Matrix: Water

Analytical Method: RSK175

Cal Date: 07/19/2017 11:32

Workgroup #: WG631960

Analyst: HRF

Run Date: 09/29/2017 18:37

Collect Date: 09/26/2017 15:40

Dilution: 5

File ID: 16G53509

Sample Tag: DL01

Units: ug/L

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 1270   |      | 25.0 | 5.00 |

Sample #: L17091702-06

PrePrep Method: N/A

Instrument: HPMS8

Client ID: 0019-PW-092717

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 09/13/2017 19:41

Workgroup #: WG632680

Analyst: HRF

Run Date: 10/05/2017 16:02

Collect Date: 09/27/2017 10:45

Dilution: 1

File ID: 8M421958

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #   | Result | Qual | RL   | MDL   |
|---------------------------|---------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5 |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5 |        | U    | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                  | CAS #     | Result      | Qual        | RL   | MDL   |
|--------------------------|-----------|-------------|-------------|------|-------|
| 1,1-Dichloroethane       | 75-34-3   |             | U           | 1.00 | 0.125 |
| 1,1-Dichloroethene       | 75-35-4   |             | U           | 1.00 | 0.500 |
| 1,2-Dichloroethane       | 107-06-2  |             | U           | 1.00 | 0.250 |
| 1,2-Dichloropropane      | 78-87-5   |             | U           | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene   | 95-63-6   |             | U           | 1.00 | 0.250 |
| 1,4-Dichlorobenzene      | 106-46-7  |             | U           | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene   | 108-67-8  |             | U           | 1.00 | 0.250 |
| 1,3-Dichlorobenzene      | 541-73-1  |             | U           | 1.00 | 0.250 |
| 2-Butanone               | 78-93-3   |             | U           | 5.00 | 2.50  |
| 4-Methyl-2-pentanone     | 108-10-1  |             | U           | 5.00 | 2.50  |
| Acetone                  | 67-64-1   |             | U           | 5.00 | 2.50  |
| 2-Hexanone               | 591-78-6  |             | U           | 5.00 | 2.50  |
| Benzene                  | 71-43-2   |             | U           | 1.00 | 0.125 |
| Bromodichloromethane     | 75-27-4   |             | U           | 1.00 | 0.250 |
| Bromomethane             | 74-83-9   |             | U           | 1.00 | 0.500 |
| Carbon disulfide         | 75-15-0   |             | U           | 1.00 | 0.500 |
| Carbon tetrachloride     | 56-23-5   |             | U           | 1.00 | 0.250 |
| Chlorobenzene            | 108-90-7  |             | U           | 1.00 | 0.125 |
| Chloroform               | 67-66-3   |             | U           | 1.00 | 0.125 |
| Dibromochloromethane     | 124-48-1  |             | U           | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8   |             | U           | 1.00 | 0.250 |
| Chloromethane            | 74-87-3   |             | U           | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2  |             | U           | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7   |             | U           | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4  |             | U           | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2   |             | U           | 1.00 | 0.250 |
| Naphthalene              | 91-20-3   |             | U           | 1.00 | 0.200 |
| Styrene                  | 100-42-5  |             | U           | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4  |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3  |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5  |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6   |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4   |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4   |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7 |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery  | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 94.2      | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 96.4      | 75          | 120         |      |       |
| Dibromofluoromethane     | 93.6      | 85          | 115         |      |       |

## Certificate of Analysis

|            |  |    |     |  |
|------------|--|----|-----|--|
| Toluene-d8 | 94.5   | 85 | 120 |  |
| U          | Not detected at or above the reporting limit (RL). |    |     |  |

Sample #: L17091702-06      PrePrep Method: N/A      Instrument: HP16  
 Client ID: 0019-PW-092717      Prep Method: 5021      Prep Date: N/A  
 Matrix: Water      Analytical Method: RSK175      Cal Date: 07/19/2017 11:32  
 Workgroup #: WG632131      Analyst: HRF      Run Date: 10/02/2017 17:13  
 Collect Date: 09/27/2017 10:45      Dilution: 20      File ID: 16G53530  
 Sample Tag: DL01      Units: ug/L

| Analyte | CAS #   | Result | Qual | RL  | MDL  |
|---------|---------|--------|------|-----|------|
| Methane | 74-82-8 | 7500   |      | 100 | 20.0 |

Sample #: L17091702-07      PrePrep Method: N/A      Instrument: HPMS8  
 Client ID: 0298-PW-092717      Prep Method: 5030B/5030C/5035A      Prep Date: N/A  
 Matrix: Water      Analytical Method: 8260B      Cal Date: 09/13/2017 19:41  
 Workgroup #: WG632680      Analyst: HRF      Run Date: 10/05/2017 16:32  
 Collect Date: 09/27/2017 11:40      Dilution: 1      File ID: 8M421959  
 Sample Tag: 01      Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        | U    | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 |        | U    | 1.00 | 0.125 |

## Certificate of Analysis

| Analyte                  | CAS #     | Result | Qual | RL   | MDL   |
|--------------------------|-----------|--------|------|------|-------|
| Chloroform               | 67-66-3   |        | U    | 1.00 | 0.125 |
| Dibromochloromethane     | 124-48-1  |        | U    | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8   |        | U    | 1.00 | 0.250 |
| Chloromethane            | 74-87-3   |        | U    | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2  |        | U    | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7   |        | U    | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4  |        | U    | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2   |        | U    | 1.00 | 0.250 |
| Naphthalene              | 91-20-3   |        | U    | 1.00 | 0.200 |
| Styrene                  | 100-42-5  |        | U    | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4  |        | U    | 1.00 | 0.250 |
| Toluene                  | 108-88-3  |        | U    | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5  |        | U    | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6   |        | U    | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4   |        | U    | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4   |        | U    | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7 |        | U    | 1.00 | 0.500 |

| Surrogate             | Recovery | Lower Limit | Upper Limit | Q |  |
|-----------------------|----------|-------------|-------------|---|--|
| 1,2-Dichloroethane-d4 | 91.3     | 70          | 120         |   |  |
| 4-Bromofluorobenzene  | 96.1     | 75          | 120         |   |  |
| Dibromofluoromethane  | 93.1     | 85          | 115         |   |  |
| Toluene-d8            | 95.5     | 85          | 120         |   |  |

|   |  |
|---|--|
| U | Not detected at or above the reporting limit (RL). |
|---|--|

Sample #: L17091702-07

PrePrep Method: N/A

Instrument: HP16

Client ID: 0298-PW-092717

Prep Method: 5021

Prep Date: N/A

Matrix: Water

Analytical Method: RSK175

Cal Date: 07/19/2017 11:32

Workgroup #: WG632131

Analyst: HRF

Run Date: 10/02/2017 17:25

Collect Date: 09/27/2017 11:40

Dilution: 5

File ID: 16G53531

Sample Tag: DL01

Units: ug/L

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 1670   |      | 25.0 | 5.00 |

## Certificate of Analysis

Sample #: L17091702-08

PrePrep Method: N/A

Instrument: HPMS8

Client ID: 0300-PW-092717

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 09/13/2017 19:41

Workgroup #: WG632680

Analyst: HRF

Run Date: 10/05/2017 17:01

Collect Date: 09/27/2017 14:00

Dilution: 1

File ID: 8M421960

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        | U    | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 |        | U    | 1.00 | 0.125 |
| Chloroform                | 67-66-3  |        | U    | 1.00 | 0.125 |
| Dibromochloromethane      | 124-48-1 |        | U    | 1.00 | 0.250 |
| Dichlorodifluoromethane   | 75-71-8  |        | U    | 1.00 | 0.250 |
| Chloromethane             | 74-87-3  |        | U    | 1.00 | 0.500 |
| cis-1,2-Dichloroethene    | 156-59-2 |        | U    | 1.00 | 0.250 |
| Diethyl ether             | 60-29-7  |        | U    | 10.0 | 5.00  |
| Ethylbenzene              | 100-41-4 |        | U    | 1.00 | 0.250 |
| Methylene chloride        | 75-09-2  |        | U    | 1.00 | 0.250 |
| Naphthalene               | 91-20-3  |        | U    | 1.00 | 0.200 |
| Styrene                   | 100-42-5 |        | U    | 1.00 | 0.125 |
| Tetrachloroethene         | 127-18-4 |        | U    | 1.00 | 0.250 |
| Toluene                   | 108-88-3 |        | U    | 1.00 | 0.250 |
| trans-1,2-Dichloroethene  | 156-60-5 |        | U    | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                | CAS #  | Result      | Qual        | RL   | MDL   |
|------------------------|--|-------------|-------------|------|-------|
| Trichloroethene        | 79-01-6  |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4  |             | U           | 1.00 | 0.250 |
| Vinyl chloride         | 75-01-4  |             | U           | 1.00 | 0.250 |
| Xylenes                | 1330-20-7  |             | U           | 1.00 | 0.500 |
| Surrogate              | Recovery   | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4  | 90.7   | 70          | 120         |      |       |
| 4-Bromofluorobenzene   | 97.5   | 75          | 120         |      |       |
| Dibromofluoromethane   | 91.3   | 85          | 115         |      |       |
| Toluene-d8             | 95.7   | 85          | 120         |      |       |
| U                      | Not detected at or above the reporting limit (RL). |             |             |      |       |

Sample #: L17091702-08

PrePrep Method: N/A

Instrument: HP16

Client ID: 0300-PW-092717

Prep Method: 5021

Prep Date: N/A

Matrix: Water

Analytical Method: RSK175

Cal Date: 07/19/2017 11:32

Workgroup #: WG631960

Analyst: HRF

Run Date: 09/29/2017 17:15

Collect Date: 09/27/2017 14:00

Dilution: 1

File ID: 16G53502

Sample Tag: 01

Units: ug/L

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 597    |      | 5.00 | 1.00 |

Sample #: L17091702-09

PrePrep Method: N/A

Instrument: HPMS8

Client ID: 0301-PW-092717

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 09/13/2017 19:41

Workgroup #: WG632680

Analyst: HRF

Run Date: 10/05/2017 17:31

Collect Date: 09/27/2017 15:55

Dilution: 1

File ID: 8M421961

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |

## Certificate of Analysis

| Analyte                  | CAS #     | Result      | Qual        | RL   | MDL   |
|--------------------------|-----------|-------------|-------------|------|-------|
| 4-Methyl-2-pentanone     | 108-10-1  |             | U           | 5.00 | 2.50  |
| Acetone                  | 67-64-1   |             | U           | 5.00 | 2.50  |
| 2-Hexanone               | 591-78-6  |             | U           | 5.00 | 2.50  |
| Benzene                  | 71-43-2   |             | U           | 1.00 | 0.125 |
| Bromodichloromethane     | 75-27-4   |             | U           | 1.00 | 0.250 |
| Bromomethane             | 74-83-9   |             | U           | 1.00 | 0.500 |
| Carbon disulfide         | 75-15-0   |             | U           | 1.00 | 0.500 |
| Carbon tetrachloride     | 56-23-5   |             | U           | 1.00 | 0.250 |
| Chlorobenzene            | 108-90-7  |             | U           | 1.00 | 0.125 |
| Chloroform               | 67-66-3   |             | U           | 1.00 | 0.125 |
| Dibromochloromethane     | 124-48-1  |             | U           | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8   |             | U           | 1.00 | 0.250 |
| Chloromethane            | 74-87-3   |             | U           | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2  |             | U           | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7   | 27.6        |             | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4  |             | U           | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2   |             | U           | 1.00 | 0.250 |
| Naphthalene              | 91-20-3   |             | U           | 1.00 | 0.200 |
| Styrene                  | 100-42-5  |             | U           | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4  |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3  |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5  |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6   |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4   |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4   |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7 |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery  | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 91.0      | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 97.6      | 75          | 120         |      |       |
| Dibromofluoromethane     | 92.4      | 85          | 115         |      |       |
| Toluene-d8               | 96.3      | 85          | 120         |      |       |

U Not detected at or above the reporting limit (RL).

Sample #: L17091702-09

PrePrep Method: N/A

Instrument: HP16

Client ID: 0301-PW-092717

Prep Method: 5021

Prep Date: N/A

Matrix: Water

Analytical Method: RSK175

Cal Date: 07/19/2017 11:32

Workgroup #: WG631960

Analyst: HRF

Run Date: 09/29/2017 17:26

Collect Date: 09/27/2017 15:55

Dilution: 1

File ID: 16G53503

Sample Tag: 01

Units: ug/L

## Certificate of Analysis

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 109    |      | 5.00 | 1.00 |

Sample #: L17091702-10  
 Client ID: 0305-PW-092717  
 Matrix: Water  
 Workgroup #: WG632680  
 Collect Date: 09/27/2017 16:55  
 Sample Tag: 01

PrePrep Method: N/A  
 Prep Method: 5030B/5030C/5035A  
 Analytical Method: 8260B  
 Analyst: HRF  
 Dilution: 1  
 Units: ug/L

Instrument: HPMS8  
 Prep Date: N/A  
 Cal Date: 09/13/2017 19:41  
 Run Date: 10/05/2017 18:00  
 File ID: 8M421962

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        | U    | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 |        | U    | 1.00 | 0.125 |
| Chloroform                | 67-66-3  |        | U    | 1.00 | 0.125 |
| Dibromochloromethane      | 124-48-1 |        | U    | 1.00 | 0.250 |
| Dichlorodifluoromethane   | 75-71-8  |        | U    | 1.00 | 0.250 |
| Chloromethane             | 74-87-3  |        | U    | 1.00 | 0.500 |
| cis-1,2-Dichloroethene    | 156-59-2 |        | U    | 1.00 | 0.250 |
| Diethyl ether             | 60-29-7  | 41.3   |      | 10.0 | 5.00  |
| Ethylbenzene              | 100-41-4 |        | U    | 1.00 | 0.250 |
| Methylene chloride        | 75-09-2  |        | U    | 1.00 | 0.250 |
| Naphthalene               | 91-20-3  |        | U    | 1.00 | 0.200 |
| Styrene                   | 100-42-5 |        | U    | 1.00 | 0.125 |

## Certificate of Analysis

| Analyte                  | CAS #     | Result | Qual | RL   | MDL   |
|--------------------------|-----------|--------|------|------|-------|
| Tetrachloroethene        | 127-18-4  |        | U    | 1.00 | 0.250 |
| Toluene                  | 108-88-3  |        | U    | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5  |        | U    | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6   |        | U    | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4   |        | U    | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4   |        | U    | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7 |        | U    | 1.00 | 0.500 |

| Surrogate             | Recovery | Lower Limit | Upper Limit | Q |  |
|-----------------------|----------|-------------|-------------|---|--|
| 1,2-Dichloroethane-d4 | 93.2     | 70          | 120         |   |  |
| 4-Bromofluorobenzene  | 98.5     | 75          | 120         |   |  |
| Dibromofluoromethane  | 93.9     | 85          | 115         |   |  |
| Toluene-d8            | 95.1     | 85          | 120         |   |  |

|   |  |
|---|--|
| U | Not detected at or above the reporting limit (RL). |
|---|--|

Sample #: L17091702-10      PrePrep Method: N/A      Instrument: HP16  
 Client ID: 0305-PW-092717      Prep Method: 5021      Prep Date: N/A  
 Matrix: Water      Analytical Method: RSK175      Cal Date: 07/19/2017 11:32  
 Workgroup #: WG632131      Analyst: HRF      Run Date: 10/02/2017 17:36  
 Collect Date: 09/27/2017 16:55      Dilution: 10      File ID: 16G53532  
 Sample Tag: DL01      Units: ug/L

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 5890   |      | 50.0 | 10.0 |

Sample #: L17091702-11      PrePrep Method: N/A      Instrument: HPMS8  
 Client ID: INS-TB01-092717      Prep Method: 5030B/5030C/5035A      Prep Date: N/A  
 Matrix: Water      Analytical Method: 8260B      Cal Date: 09/13/2017 19:41  
 Workgroup #: WG632478      Analyst: HRF      Run Date: 10/04/2017 13:56  
 Collect Date: 09/27/2017 18:15      Dilution: 1      File ID: 8M421919  
 Sample Tag: 01      Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |

## Certificate of Analysis

| Analyte                  | CAS #     | Result | Qual | RL   | MDL   |
|--------------------------|-----------|--------|------|------|-------|
| 1,3,5-Trimethylbenzene   | 108-67-8  |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene      | 541-73-1  |        | U    | 1.00 | 0.250 |
| 2-Butanone               | 78-93-3   |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone     | 108-10-1  |        | U    | 5.00 | 2.50  |
| Acetone                  | 67-64-1   |        | U    | 5.00 | 2.50  |
| 2-Hexanone               | 591-78-6  |        | U    | 5.00 | 2.50  |
| Benzene                  | 71-43-2   |        | U    | 1.00 | 0.125 |
| Bromodichloromethane     | 75-27-4   |        | U    | 1.00 | 0.250 |
| Bromomethane             | 74-83-9   |        | U    | 1.00 | 0.500 |
| Carbon disulfide         | 75-15-0   |        | U    | 1.00 | 0.500 |
| Carbon tetrachloride     | 56-23-5   |        | U    | 1.00 | 0.250 |
| Chlorobenzene            | 108-90-7  |        | U    | 1.00 | 0.125 |
| Chloroform               | 67-66-3   |        | U    | 1.00 | 0.125 |
| Dibromochloromethane     | 124-48-1  |        | U    | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8   |        | U    | 1.00 | 0.250 |
| Chloromethane            | 74-87-3   |        | U    | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2  |        | U    | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7   |        | U    | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4  |        | U    | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2   |        | U    | 1.00 | 0.250 |
| Naphthalene              | 91-20-3   |        | U    | 1.00 | 0.200 |
| Styrene                  | 100-42-5  |        | U    | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4  |        | U    | 1.00 | 0.250 |
| Toluene                  | 108-88-3  |        | U    | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5  |        | U    | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6   |        | U    | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4   |        | U    | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4   |        | U    | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7 |        | U    | 1.00 | 0.500 |

| Surrogate             | Recovery | Lower Limit | Upper Limit | Q |  |
|-----------------------|----------|-------------|-------------|---|--|
| 1,2-Dichloroethane-d4 | 93.4     | 70          | 120         |   |  |
| 4-Bromofluorobenzene  | 98.6     | 75          | 120         |   |  |
| Dibromofluoromethane  | 93.0     | 85          | 115         |   |  |
| Toluene-d8            | 96.6     | 85          | 120         |   |  |

|   |  |
|---|--|
| U | Not detected at or above the reporting limit (RL). |
|---|--|

## **2.1 Volatiles Data**

## **2.1.1 Volatiles GCMS Data (8260)**

## **2.1.1.1 Summary Data**



**Login Number:** L17091702

**Department:** Volatiles

**Analyst:** Heather Fairchild

## METHOD

**Preparation** SW-846 5030B/5030C/5035A

**Analysis** SW-846 8260B

## HOLDING TIMES

**Sample Preparation:** All holding times were met.

**Sample Analysis:** All holding times were met.

## PREPARATION

Sample preparation proceeded normally.

## CALIBRATION

**Initial Calibration:** For all compounds that yielded a %RSD greater than 15%, linear or higher order equations were applied. All acceptance criteria were met.

**Alternate Source Standards:** All acceptance criteria were met.

**Continuing Calibration and Tune:** All acceptance criteria were met.

## BATCH QA/QC

**Method Blank:** All acceptance criteria were met.

**Laboratory Control Sample:** All acceptance criteria were met.

**Matrix Spikes:** All acceptance criteria were met.

## SAMPLES

**Internal Standards:** All acceptance criteria were met.

**Surrogates:** All acceptance criteria were met.

**Other:** None.

### **Manual Integration Reason Codes**

**Reason #1: Data System Fails to Select Correct Peak.** In some cases the chromatography system selects and integrates the 'wrong peak'. In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

**Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak.** This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low areacounts for the target compound.

**Reason #3: Improperly Integrated Isomers and/or coeluting compounds.** This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

**Reason #4: System Establishes Incorrect Baseline.** There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and should be corrected via manual procedures.

**Reason #5: Miscellaneous.** Other situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the laboratory management. If the form of manual integration is not clearly covered by these four cases, then review and approval by the Managing Director or the QAO will be required.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

**Narrative ID:** 130300

**Approved By:** Sarah Vandenberg



## Certificate of Analysis

Sample #: L17091702-01

PrePrep Method: N/A

Instrument: HPMS8

Client ID: 0293-PW-092617

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 09/13/2017 19:41

Workgroup #: WG632680

Analyst: HRF

Run Date: 10/05/2017 15:02

Collect Date: 09/26/2017 14:25

Dilution: 1

File ID: 8M421956

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        | U    | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 | 38.8   |      | 1.00 | 0.125 |
| Chloroform                | 67-66-3  |        | U    | 1.00 | 0.125 |
| Dibromochloromethane      | 124-48-1 |        | U    | 1.00 | 0.250 |
| Dichlorodifluoromethane   | 75-71-8  |        | U    | 1.00 | 0.250 |
| Chloromethane             | 74-87-3  |        | U    | 1.00 | 0.500 |
| cis-1,2-Dichloroethene    | 156-59-2 |        | U    | 1.00 | 0.250 |
| Diethyl ether             | 60-29-7  |        | U    | 10.0 | 5.00  |
| Ethylbenzene              | 100-41-4 |        | U    | 1.00 | 0.250 |
| Methylene chloride        | 75-09-2  |        | U    | 1.00 | 0.250 |
| Naphthalene               | 91-20-3  |        | U    | 1.00 | 0.200 |
| Styrene                   | 100-42-5 |        | U    | 1.00 | 0.125 |
| Tetrachloroethene         | 127-18-4 |        | U    | 1.00 | 0.250 |
| Toluene                   | 108-88-3 |        | U    | 1.00 | 0.250 |
| trans-1,2-Dichloroethene  | 156-60-5 |        | U    | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                | CAS #  | Result      |             | Qual | RL   | MDL   |
|------------------------|--|-------------|-------------|------|------|-------|
| Trichloroethene        | 79-01-6  |             |             | U    | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4  |             |             | U    | 1.00 | 0.250 |
| Vinyl chloride         | 75-01-4  |             |             | U    | 1.00 | 0.250 |
| Xylenes                | 1330-20-7  |             |             | U    | 1.00 | 0.500 |
| Surrogate              | Recovery   | Lower Limit | Upper Limit | Q    |      |       |
| 1,2-Dichloroethane-d4  | 91.8   | 70          | 120         |      |      |       |
| 4-Bromofluorobenzene   | 99.3   | 75          | 120         |      |      |       |
| Dibromofluoromethane   | 91.4   | 85          | 115         |      |      |       |
| Toluene-d8             | 94.8   | 85          | 120         |      |      |       |
| U                      | Not detected at or above the reporting limit (RL). |             |             |      |      |       |

Sample #: L17091702-02

PrePrep Method: N/A

Instrument: HPMS8

Client ID: 0293-PW-092617D

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 09/13/2017 19:41

Workgroup #: WG632680

Analyst: HRF

Run Date: 10/05/2017 15:33

Collect Date: 09/26/2017 14:30

Dilution: 1

File ID: 8M421957

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result |  | Qual | RL   | MDL   |
|---------------------------|----------|--------|--|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        |  | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        |  | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        |  | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        |  | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        |  | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        |  | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        |  | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        |  | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        |  | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        |  | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        |  | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        |  | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        |  | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        |  | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        |  | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        |  | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        |  | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        |  | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        |  | U    | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 | 42.2   |  |      | 1.00 | 0.125 |
| Chloroform                | 67-66-3  |        |  | U    | 1.00 | 0.125 |

## Certificate of Analysis

| Analyte                  | CAS #  | Result      | Qual        | RL   | MDL   |
|--------------------------|--|-------------|-------------|------|-------|
| Dibromochloromethane     | 124-48-1   |             | U           | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8  |             | U           | 1.00 | 0.250 |
| Chloromethane            | 74-87-3  |             | U           | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2   |             | U           | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7  |             | U           | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4   |             | U           | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2  |             | U           | 1.00 | 0.250 |
| Naphthalene              | 91-20-3  |             | U           | 1.00 | 0.200 |
| Styrene                  | 100-42-5   |             | U           | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4   |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3   |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5   |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6  |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4  |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4  |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7  |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery   | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 92.8   | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 96.1   | 75          | 120         |      |       |
| Dibromofluoromethane     | 92.3   | 85          | 115         |      |       |
| Toluene-d8               | 96.7   | 85          | 120         |      |       |
| U                        | Not detected at or above the reporting limit (RL). |             |             |      |       |

Sample #: L17091702-03

PrePrep Method: N/A

Instrument: HPMS8

Client ID: 0297-PW-092617

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 09/13/2017 19:41

Workgroup #: WG632680

Analyst: HRF

Run Date: 10/05/2017 14:02

Collect Date: 09/26/2017 15:40

Dilution: 1

File ID: 8M421954

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                  | CAS #     | Result      | Qual        | RL   | MDL   |
|--------------------------|-----------|-------------|-------------|------|-------|
| 1,3-Dichlorobenzene      | 541-73-1  |             | U           | 1.00 | 0.250 |
| 2-Butanone               | 78-93-3   |             | U           | 5.00 | 2.50  |
| 4-Methyl-2-pentanone     | 108-10-1  |             | U           | 5.00 | 2.50  |
| Acetone                  | 67-64-1   |             | U           | 5.00 | 2.50  |
| 2-Hexanone               | 591-78-6  |             | U           | 5.00 | 2.50  |
| Benzene                  | 71-43-2   |             | U           | 1.00 | 0.125 |
| Bromodichloromethane     | 75-27-4   |             | U           | 1.00 | 0.250 |
| Bromomethane             | 74-83-9   |             | U           | 1.00 | 0.500 |
| Carbon disulfide         | 75-15-0   |             | U           | 1.00 | 0.500 |
| Carbon tetrachloride     | 56-23-5   |             | U           | 1.00 | 0.250 |
| Chlorobenzene            | 108-90-7  | 3.30        |             | 1.00 | 0.125 |
| Chloroform               | 67-66-3   |             | U           | 1.00 | 0.125 |
| Dibromochloromethane     | 124-48-1  |             | U           | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8   |             | U           | 1.00 | 0.250 |
| Chloromethane            | 74-87-3   |             | U           | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2  |             | U           | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7   |             | U           | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4  |             | U           | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2   |             | U           | 1.00 | 0.250 |
| Naphthalene              | 91-20-3   |             | U           | 1.00 | 0.200 |
| Styrene                  | 100-42-5  |             | U           | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4  |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3  |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5  |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6   |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4   |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4   |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7 |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery  | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 94.6      | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 97.6      | 75          | 120         |      |       |
| Dibromofluoromethane     | 93.9      | 85          | 115         |      |       |
| Toluene-d8               | 96.6      | 85          | 120         |      |       |

U Not detected at or above the reporting limit (RL).

## Certificate of Analysis

Sample #: L17091702-04  
 Client ID: 0297-PW-092617MS  
 Matrix: Water  
 Workgroup #: WG632680  
 Collect Date: 09/26/2017 15:40  
 Sample Tag: 01

PrePrep Method: N/A  
 Prep Method: 5030B/5030C/5035A  
 Analytical Method: 8260B  
 Analyst: HRF  
 Dilution: 1  
 Units: ug/L

Instrument: HPMS8  
 Prep Date: N/A  
 Cal Date: 09/13/2017 19:41  
 Run Date: 10/05/2017 12:31  
 File ID: 8M421951

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  | 20.2   |      | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  | 19.6   |      | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  | 18.0   |      | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  | 18.1   |      | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 | 19.4   |      | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  | 19.1   |      | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  | 20.2   |      | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 | 19.3   |      | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 | 19.5   |      | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 | 19.2   |      | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  | 20.3   |      | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 | 19.9   |      | 5.00 | 2.50  |
| Acetone                   | 67-64-1  | 20.1   |      | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 | 19.5   |      | 5.00 | 2.50  |
| Benzene                   | 71-43-2  | 19.5   |      | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  | 19.0   |      | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  | 14.5   |      | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  | 16.9   |      | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  | 19.0   |      | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 | 21.5   |      | 1.00 | 0.125 |
| Chloroform                | 67-66-3  | 18.4   |      | 1.00 | 0.125 |
| Dibromochloromethane      | 124-48-1 | 19.4   |      | 1.00 | 0.250 |
| Dichlorodifluoromethane   | 75-71-8  | 17.8   |      | 1.00 | 0.250 |
| Chloromethane             | 74-87-3  | 18.6   |      | 1.00 | 0.500 |
| cis-1,2-Dichloroethene    | 156-59-2 | 18.6   |      | 1.00 | 0.250 |
| Diethyl ether             | 60-29-7  | 95.4   |      | 10.0 | 5.00  |
| Ethylbenzene              | 100-41-4 | 18.5   |      | 1.00 | 0.250 |
| Methylene chloride        | 75-09-2  | 19.0   |      | 1.00 | 0.250 |
| Naphthalene               | 91-20-3  | 19.9   |      | 1.00 | 0.200 |
| Styrene                   | 100-42-5 | 20.2   |      | 1.00 | 0.125 |
| Tetrachloroethene         | 127-18-4 | 17.6   |      | 1.00 | 0.250 |
| Toluene                   | 108-88-3 | 18.9   |      | 1.00 | 0.250 |
| trans-1,2-Dichloroethene  | 156-60-5 | 18.5   |      | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                | CAS #     | Result      | Qual        | RL   | MDL   |
|------------------------|-----------|-------------|-------------|------|-------|
| Trichloroethene        | 79-01-6   | 20.4        |             | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4   | 18.8        |             | 1.00 | 0.250 |
| Vinyl chloride         | 75-01-4   | 23.2        |             | 1.00 | 0.250 |
| Xylenes                | 1330-20-7 | 57.7        |             | 1.00 | 0.500 |
| Surrogate              | Recovery  | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4  | 93.2      | 70          | 120         |      |       |
| 4-Bromofluorobenzene   | 98.6      | 75          | 120         |      |       |
| Dibromofluoromethane   | 93.3      | 85          | 115         |      |       |
| Toluene-d8             | 95.4      | 85          | 120         |      |       |

Sample #: L17091702-05

PrePrep Method: N/A

Instrument: HPMS8

Client ID: 0297-PW-092617SD

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 09/13/2017 19:41

Workgroup #: WG632680

Analyst: HRF

Run Date: 10/05/2017 13:02

Collect Date: 09/26/2017 15:40

Dilution: 1

File ID: 8M421952

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  | 19.1   |      | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  | 19.1   |      | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  | 18.1   |      | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  | 17.7   |      | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 | 19.1   |      | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  | 19.2   |      | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  | 20.3   |      | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 | 19.2   |      | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 | 19.4   |      | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 | 18.8   |      | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  | 18.6   |      | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 | 17.4   |      | 5.00 | 2.50  |
| Acetone                   | 67-64-1  | 19.1   |      | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 | 17.6   |      | 5.00 | 2.50  |
| Benzene                   | 71-43-2  | 19.5   |      | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  | 18.9   |      | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  | 14.2   |      | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  | 16.0   |      | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  | 18.6   |      | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 | 21.2   |      | 1.00 | 0.125 |
| Chloroform                | 67-66-3  | 18.4   |      | 1.00 | 0.125 |
| Dibromochloromethane      | 124-48-1 | 18.7   |      | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                  | CAS #     | Result      | Qual        | RL   | MDL   |
|--------------------------|-----------|-------------|-------------|------|-------|
| Dichlorodifluoromethane  | 75-71-8   | 16.3        |             | 1.00 | 0.250 |
| Chloromethane            | 74-87-3   | 17.3        |             | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2  | 18.7        |             | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7   | 90.3        |             | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4  | 18.7        |             | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2   | 19.1        |             | 1.00 | 0.250 |
| Naphthalene              | 91-20-3   | 19.3        |             | 1.00 | 0.200 |
| Styrene                  | 100-42-5  | 20.4        |             | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4  | 17.6        |             | 1.00 | 0.250 |
| Toluene                  | 108-88-3  | 18.7        |             | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5  | 18.5        |             | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6   | 20.1        |             | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4   | 17.8        |             | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4   | 22.1        |             | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7 | 57.3        |             | 1.00 | 0.500 |
| Surrogate                | Recovery  | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 91.7      | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 97.5      | 75          | 120         |      |       |
| Dibromofluoromethane     | 94.2      | 85          | 115         |      |       |
| Toluene-d8               | 95.1      | 85          | 120         |      |       |

Sample #: L17091702-06

PrePrep Method: N/A

Instrument: HPMS8

Client ID: 0019-PW-092717

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 09/13/2017 19:41

Workgroup #: WG632680

Analyst: HRF

Run Date: 10/05/2017 16:02

Collect Date: 09/27/2017 10:45

Dilution: 1

File ID: 8M421958

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |

## Certificate of Analysis

| Analyte                  | CAS #  | Result      | Qual        | RL   | MDL   |
|--------------------------|--|-------------|-------------|------|-------|
| 4-Methyl-2-pentanone     | 108-10-1   |             | U           | 5.00 | 2.50  |
| Acetone                  | 67-64-1  |             | U           | 5.00 | 2.50  |
| 2-Hexanone               | 591-78-6   |             | U           | 5.00 | 2.50  |
| Benzene                  | 71-43-2  |             | U           | 1.00 | 0.125 |
| Bromodichloromethane     | 75-27-4  |             | U           | 1.00 | 0.250 |
| Bromomethane             | 74-83-9  |             | U           | 1.00 | 0.500 |
| Carbon disulfide         | 75-15-0  |             | U           | 1.00 | 0.500 |
| Carbon tetrachloride     | 56-23-5  |             | U           | 1.00 | 0.250 |
| Chlorobenzene            | 108-90-7   |             | U           | 1.00 | 0.125 |
| Chloroform               | 67-66-3  |             | U           | 1.00 | 0.125 |
| Dibromochloromethane     | 124-48-1   |             | U           | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8  |             | U           | 1.00 | 0.250 |
| Chloromethane            | 74-87-3  |             | U           | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2   |             | U           | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7  |             | U           | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4   |             | U           | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2  |             | U           | 1.00 | 0.250 |
| Naphthalene              | 91-20-3  |             | U           | 1.00 | 0.200 |
| Styrene                  | 100-42-5   |             | U           | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4   |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3   |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5   |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6  |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4  |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4  |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7  |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery   | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 94.2   | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 96.4   | 75          | 120         |      |       |
| Dibromofluoromethane     | 93.6   | 85          | 115         |      |       |
| Toluene-d8               | 94.5   | 85          | 120         |      |       |
| U                        | Not detected at or above the reporting limit (RL). |             |             |      |       |

Sample #: L17091702-07

PrePrep Method: N/A

Instrument: HPMS8

Client ID: 0298-PW-092717

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 09/13/2017 19:41

Workgroup #: WG632680

Analyst: HRF

Run Date: 10/05/2017 16:32

Collect Date: 09/27/2017 11:40

Dilution: 1

File ID: 8M421959

Sample Tag: 01

Units: ug/L

## Certificate of Analysis

| Analyte                   | CAS #     | Result      | Qual        | RL   | MDL   |
|---------------------------|-----------|-------------|-------------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5   |             | U           | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5   |             | U           | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3   |             | U           | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4   |             | U           | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2  |             | U           | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5   |             | U           | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6   |             | U           | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7  |             | U           | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8  |             | U           | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1  |             | U           | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3   |             | U           | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1  |             | U           | 5.00 | 2.50  |
| Acetone                   | 67-64-1   |             | U           | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6  |             | U           | 5.00 | 2.50  |
| Benzene                   | 71-43-2   |             | U           | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4   |             | U           | 1.00 | 0.250 |
| Bromomethane              | 74-83-9   |             | U           | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0   |             | U           | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5   |             | U           | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7  |             | U           | 1.00 | 0.125 |
| Chloroform                | 67-66-3   |             | U           | 1.00 | 0.125 |
| Dibromochloromethane      | 124-48-1  |             | U           | 1.00 | 0.250 |
| Dichlorodifluoromethane   | 75-71-8   |             | U           | 1.00 | 0.250 |
| Chloromethane             | 74-87-3   |             | U           | 1.00 | 0.500 |
| cis-1,2-Dichloroethene    | 156-59-2  |             | U           | 1.00 | 0.250 |
| Diethyl ether             | 60-29-7   |             | U           | 10.0 | 5.00  |
| Ethylbenzene              | 100-41-4  |             | U           | 1.00 | 0.250 |
| Methylene chloride        | 75-09-2   |             | U           | 1.00 | 0.250 |
| Naphthalene               | 91-20-3   |             | U           | 1.00 | 0.200 |
| Styrene                   | 100-42-5  |             | U           | 1.00 | 0.125 |
| Tetrachloroethene         | 127-18-4  |             | U           | 1.00 | 0.250 |
| Toluene                   | 108-88-3  |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene  | 156-60-5  |             | U           | 1.00 | 0.250 |
| Trichloroethene           | 79-01-6   |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane    | 75-69-4   |             | U           | 1.00 | 0.250 |
| Vinyl chloride            | 75-01-4   |             | U           | 1.00 | 0.250 |
| Xylenes                   | 1330-20-7 |             | U           | 1.00 | 0.500 |
| Surrogate                 | Recovery  | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4     | 91.3      | 70          | 120         |      |       |

## Certificate of Analysis

|                      |      |    |     |  |  |
|----------------------|------|----|-----|--|--|
| 4-Bromofluorobenzene | 96.1 | 75 | 120 |  |  |
| Dibromofluoromethane | 93.1 | 85 | 115 |  |  |
| Toluene-d8           | 95.5 | 85 | 120 |  |  |

|   |  |
|---|--|
| U | Not detected at or above the reporting limit (RL). |
|---|--|

Sample #: L17091702-08

Client ID: 0300-PW-092717

Matrix: Water

Workgroup #: WG632680

Collect Date: 09/27/2017 14:00

Sample Tag: 01

PrePrep Method: N/A

Prep Method: 5030B/5030C/5035A

Analytical Method: 8260B

Analyst: HRF

Dilution: 1

Units: ug/L

Instrument: HPMS8

Prep Date: N/A

Cal Date: 09/13/2017 19:41

Run Date: 10/05/2017 17:01

File ID: 8M421960

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        | U    | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 |        | U    | 1.00 | 0.125 |
| Chloroform                | 67-66-3  |        | U    | 1.00 | 0.125 |
| Dibromochloromethane      | 124-48-1 |        | U    | 1.00 | 0.250 |
| Dichlorodifluoromethane   | 75-71-8  |        | U    | 1.00 | 0.250 |
| Chloromethane             | 74-87-3  |        | U    | 1.00 | 0.500 |
| cis-1,2-Dichloroethene    | 156-59-2 |        | U    | 1.00 | 0.250 |
| Diethyl ether             | 60-29-7  |        | U    | 10.0 | 5.00  |
| Ethylbenzene              | 100-41-4 |        | U    | 1.00 | 0.250 |
| Methylene chloride        | 75-09-2  |        | U    | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                  | CAS #  | Result      | Qual        | RL   | MDL   |
|--------------------------|--|-------------|-------------|------|-------|
| Naphthalene              | 91-20-3  |             | U           | 1.00 | 0.200 |
| Styrene                  | 100-42-5   |             | U           | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4   |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3   |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5   |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6  |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4  |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4  |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7  |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery   | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 90.7   | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 97.5   | 75          | 120         |      |       |
| Dibromofluoromethane     | 91.3   | 85          | 115         |      |       |
| Toluene-d8               | 95.7   | 85          | 120         |      |       |
| U                        | Not detected at or above the reporting limit (RL). |             |             |      |       |

Sample #: L17091702-09

PrePrep Method: N/A

Instrument: HPMS8

Client ID: 0301-PW-092717

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 09/13/2017 19:41

Workgroup #: WG632680

Analyst: HRF

Run Date: 10/05/2017 17:31

Collect Date: 09/27/2017 15:55

Dilution: 1

File ID: 8M421961

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        | U    | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                  | CAS #  | Result      | Qual        | RL   | MDL   |
|--------------------------|--|-------------|-------------|------|-------|
| Bromomethane             | 74-83-9  |             | U           | 1.00 | 0.500 |
| Carbon disulfide         | 75-15-0  |             | U           | 1.00 | 0.500 |
| Carbon tetrachloride     | 56-23-5  |             | U           | 1.00 | 0.250 |
| Chlorobenzene            | 108-90-7   |             | U           | 1.00 | 0.125 |
| Chloroform               | 67-66-3  |             | U           | 1.00 | 0.125 |
| Dibromochloromethane     | 124-48-1   |             | U           | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8  |             | U           | 1.00 | 0.250 |
| Chloromethane            | 74-87-3  |             | U           | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2   |             | U           | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7  | 27.6        |             | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4   |             | U           | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2  |             | U           | 1.00 | 0.250 |
| Naphthalene              | 91-20-3  |             | U           | 1.00 | 0.200 |
| Styrene                  | 100-42-5   |             | U           | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4   |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3   |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5   |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6  |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4  |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4  |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7  |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery   | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 91.0   | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 97.6   | 75          | 120         |      |       |
| Dibromofluoromethane     | 92.4   | 85          | 115         |      |       |
| Toluene-d8               | 96.3   | 85          | 120         |      |       |
| U                        | Not detected at or above the reporting limit (RL). |             |             |      |       |

Sample #: L17091702-10

PrePrep Method: N/A

Instrument: HPMS8

Client ID: 0305-PW-092717

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 09/13/2017 19:41

Workgroup #: WG632680

Analyst: HRF

Run Date: 10/05/2017 18:00

Collect Date: 09/27/2017 16:55

Dilution: 1

File ID: 8M421962

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #   | Result | Qual | RL   | MDL   |
|---------------------------|---------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5 |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5 |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3 |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4 |        | U    | 1.00 | 0.500 |

## Certificate of Analysis

| Analyte                  | CAS #     | Result      | Qual        | RL   | MDL   |
|--------------------------|-----------|-------------|-------------|------|-------|
| 1,2-Dichloroethane       | 107-06-2  |             | U           | 1.00 | 0.250 |
| 1,2-Dichloropropane      | 78-87-5   |             | U           | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene   | 95-63-6   |             | U           | 1.00 | 0.250 |
| 1,4-Dichlorobenzene      | 106-46-7  |             | U           | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene   | 108-67-8  |             | U           | 1.00 | 0.250 |
| 1,3-Dichlorobenzene      | 541-73-1  |             | U           | 1.00 | 0.250 |
| 2-Butanone               | 78-93-3   |             | U           | 5.00 | 2.50  |
| 4-Methyl-2-pentanone     | 108-10-1  |             | U           | 5.00 | 2.50  |
| Acetone                  | 67-64-1   |             | U           | 5.00 | 2.50  |
| 2-Hexanone               | 591-78-6  |             | U           | 5.00 | 2.50  |
| Benzene                  | 71-43-2   |             | U           | 1.00 | 0.125 |
| Bromodichloromethane     | 75-27-4   |             | U           | 1.00 | 0.250 |
| Bromomethane             | 74-83-9   |             | U           | 1.00 | 0.500 |
| Carbon disulfide         | 75-15-0   |             | U           | 1.00 | 0.500 |
| Carbon tetrachloride     | 56-23-5   |             | U           | 1.00 | 0.250 |
| Chlorobenzene            | 108-90-7  |             | U           | 1.00 | 0.125 |
| Chloroform               | 67-66-3   |             | U           | 1.00 | 0.125 |
| Dibromochloromethane     | 124-48-1  |             | U           | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8   |             | U           | 1.00 | 0.250 |
| Chloromethane            | 74-87-3   |             | U           | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2  |             | U           | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7   | 41.3        |             | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4  |             | U           | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2   |             | U           | 1.00 | 0.250 |
| Naphthalene              | 91-20-3   |             | U           | 1.00 | 0.200 |
| Styrene                  | 100-42-5  |             | U           | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4  |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3  |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5  |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6   |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4   |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4   |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7 |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery  | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 93.2      | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 98.5      | 75          | 120         |      |       |
| Dibromofluoromethane     | 93.9      | 85          | 115         |      |       |
| Toluene-d8               | 95.1      | 85          | 120         |      |       |

U Not detected at or above the reporting limit (RL).

## Certificate of Analysis

Sample #: L17091702-11

PrePrep Method: N/A

Instrument: HPMS8

Client ID: INS-TB01-092717

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 09/13/2017 19:41

Workgroup #: WG632478

Analyst: HRF

Run Date: 10/04/2017 13:56

Collect Date: 09/27/2017 18:15

Dilution: 1

File ID: 8M421919

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        | U    | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 |        | U    | 1.00 | 0.125 |
| Chloroform                | 67-66-3  |        | U    | 1.00 | 0.125 |
| Dibromochloromethane      | 124-48-1 |        | U    | 1.00 | 0.250 |
| Dichlorodifluoromethane   | 75-71-8  |        | U    | 1.00 | 0.250 |
| Chloromethane             | 74-87-3  |        | U    | 1.00 | 0.500 |
| cis-1,2-Dichloroethene    | 156-59-2 |        | U    | 1.00 | 0.250 |
| Diethyl ether             | 60-29-7  |        | U    | 10.0 | 5.00  |
| Ethylbenzene              | 100-41-4 |        | U    | 1.00 | 0.250 |
| Methylene chloride        | 75-09-2  |        | U    | 1.00 | 0.250 |
| Naphthalene               | 91-20-3  |        | U    | 1.00 | 0.200 |
| Styrene                   | 100-42-5 |        | U    | 1.00 | 0.125 |
| Tetrachloroethene         | 127-18-4 |        | U    | 1.00 | 0.250 |
| Toluene                   | 108-88-3 |        | U    | 1.00 | 0.250 |
| trans-1,2-Dichloroethene  | 156-60-5 |        | U    | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                | CAS #     | Result      | Qual        | RL   | MDL   |
|------------------------|-----------|-------------|-------------|------|-------|
| Trichloroethene        | 79-01-6   |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4   |             | U           | 1.00 | 0.250 |
| Vinyl chloride         | 75-01-4   |             | U           | 1.00 | 0.250 |
| Xylenes                | 1330-20-7 |             | U           | 1.00 | 0.500 |
| Surrogate              | Recovery  | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4  | 93.4      | 70          | 120         |      |       |
| 4-Bromofluorobenzene   | 98.6      | 75          | 120         |      |       |
| Dibromofluoromethane   | 93.0      | 85          | 115         |      |       |
| Toluene-d8             | 96.6      | 85          | 120         |      |       |

U Not detected at or above the reporting limit (RL).

## **2.1.1.2 QC Summary Data**

## Example 8260 Calculations

### 1.0 Calculating the Response Factor (RF) from the initial calibration (ICAL) data:

$$RF = [ (Ax) (Cis) ] / [ (Ais) (Cx) ]$$

where:

|   |         |
|---|---------|
| Ax = Area of the characteristic ion for the compound being measured:      | 3399156 |
| Cis = Concentration of the specific internal standard (ug/mL)             | 25      |
| Ais = Area of the characteristic ion of the specific internal standard    | 846471  |
| Cx = Concentration of the compound in the standard being measured (ug/mL) | 100     |
| RF = Calculated Response Factor   | 1.0039  |

### 2.0 Calculating the concentration ( C ) of a compound in water using the average RF: \*

$$Cx = [ (Ax) (Cis) (Vn)(D) ] / [ (Ais) (RF) (Vs) ]$$

where:

|  |          |
|--|----------|
| Ax = Area of the characteristic ion for the compound being measured    | 3122498  |
| Cis = Concentration of the specific internal standard (ug/L)           | 25       |
| D = Dilution factor for sample as a multiplier ( 10x = 10 )            | 1        |
| Ais = Area of the characteristic ion of the specific internal standard | 611048   |
| RF = Average RF from the ICAL  | 1.004    |
| Vs = Purge volume of sample (mL)                                       | 10       |
| Vn = Nominal purge volume of sample (mL) ( 10.0 mL )                   | 10       |
| Cx = Concentration of the compound in the sample being measured (ug/L) | 127.2428 |

### 3.0 Calculating the concentration ( C ) of a compound in soil using the average RF: \*

$$Cx = [ (Ax) (Cis) (Wn)(D) ] / [ (Ais) (RF) (Ws) ]$$

where:

|  |          |
|--|----------|
| Ax = Area of the characteristic ion for the compound being measured    | 3122498  |
| Cis = Concentration of the specific internal standard (ug/L)           | 25       |
| D = Dilution factor for sample as a multiplier ( 10x = 10 )            | 1        |
| Ais = Area of the characteristic ion of the specific internal standard | 611048   |
| RF = Average RF from the ICAL  | 1.004    |
| Ws = Weight of sample purged (g)                                       | 5        |
| Wn = Nominal purge weight (g) ( 5.0 g )                                | 5        |
| Cx = Concentration of the compound in the sample being measured (ug/L) | 127.2428 |

Dry weight correction:

|                        |          |
|------------------------|----------|
| Percent solids (PCT_S) | 50       |
| Cd = (Cx) (100)/PCT_S  | 254.4856 |

\* Concentrations appearing on the instrument quantitation reports are on-column results and do not take into account initial volume, final volume, and the dilution factor.

### 4.0 Concentration from Linear Regression

Step 1: Retrieve Curve Data From Plot,  $y = mx + b$

$y$  = response ratio = response of analyte / response of IS = Ax/Ais

$x$  = amount ratio = concentration analyte/concentration internal standard = Cx / Cis

$m$  = slope from curve = 0.213

$b$  = intercept from curve = - 0.00642

**Step 2: Calculate y from Quantitation Report**

$$y = 86550/593147 = 0.1459$$

**Step 3: Solve for x**

$$x = (y - b)/m = [(0.1459 - (-0.00642))/0.213 = 0.7152]$$

**Step 4: Solve for analyte concentration C<sub>x</sub>**

$$C_x = C_{IS} (x) = (25.0)(0.7152) = 17.88$$

**Example Spreadsheet Calculation:**

|   |          |
|---|----------|
| Slope from curve, m:                          | 0.213    |
| Intercept from curve, b:                      | -0.00642 |
| Area of analyte, A <sub>x</sub> :             | 86550    |
| Area of Internal Standard , A <sub>IS</sub> : | 593147   |
| Concentration of IS, C <sub>IS</sub>          | 25.00    |
| Response Ratio:                               | 0.145917 |
| Amount Ratio:                                 | 0.715195 |
| Concentration:                                | 17.87988 |
| Units of Internal Standard:                   | ug/L     |

**5.0 Concentration from Quadratic Regression****Step 1 - Retrieve Curve Data from Plot,  $y = Ax^2 + Bx + C$** 

Where:

$$Ax^2 + Bx + (C - y) = 0$$

A, B, C = constants from the ICAL quadratic regression

 $y$  = Response ratio = Area of analyte/Area of internal standard (IS) $x$  = Amount ratio = Concentration of analyte/concentration of IS**Step 2: Calculate y from Quantitation Report**

$$y = Ax/A_{IS}$$

**Step 3: Solve for x using the quadratic formula**

$$Ax^2 + Bx + C - y = 0$$

$$x = \frac{b \pm \sqrt{(b^2 - 4a(c - y))}}{2a} \quad (\text{Two possible solutions})$$

**Step 4: Solve for analyte concentration C<sub>x</sub>**

$$C_x = (C_{IS})(\text{Amount ratio})$$

**Example Spreadsheet Calculation:**

|  |                            |
|--|----------------------------|
| Value of A from plot:                      | -0.00629                   |
| Value of B from plot:                      | 0.511                      |
| Value of C from plot:                      | -0.0276                    |
| Area of unknown from quantitation report:  | 293821                     |
| Area of IS from quantitation report:       | 784848                     |
| Response ratio, y:                         | 0.374367                   |
| C - y:                                     | -0.40197                   |
| Root 1 - Computed amount ratio , X1:       | 80.44567                   |
| Root 2 - Computed amount ratio , X2:       | 0.794396 use this solution |
| Concentration of IS, C <sub>IS</sub> :     | 25.00                      |
| Concentration of analyte, C <sub>x</sub> : | 19.86 ug/L                 |

## Microbac Laboratories Inc.

## Instrument Run Log

|                     |                   |           |                  |
|---------------------|-------------------|-----------|------------------|
| Instrument:         | HPMS8             | Dataset:  | 083117           |
| Analyst1:           | ADC               | Analyst2: | NA               |
| Method:             | 8260B             | SOP:      | MSV01/OVAP MSV01 |
| Method:             | 624               | SOP:      | MSV10            |
| Method:             | 5030B/5030C/5035A | SOP:      | PAT01/OVAP PAT   |
| Maintenance Log ID: |                   | Rev:      | 25/0             |
|                     |                   | Rev:      | 15               |
|                     |                   | Rev:      | 18/1             |

Maintenance Log ID: \_\_\_\_\_

|                    |          |                     |          |
|--------------------|----------|---------------------|----------|
| Internal Standard: | STD83648 | Surrogate Standard: | STD83648 |
| CCV:               | STD83554 | LCS:                | STD83193 |
| Column 1 ID:       | RTX502.2 | Column 2 ID:        | NA       |
| Workgroups:        | WG628027 |                     |          |

Comments: \_\_\_\_\_

| File ID  | Sample Information                | pH | Mat | Dil | Reference | Date/Time      |
|----------|-----------------------------------|----|-----|-----|-----------|----------------|
| 8M421173 | WG628027-01 50ng BFB STD          | NA | 1   | 1   | STD83478  | 08/31/17 13:56 |
| 8M421174 | WG628027-01 50ng BFB STD          | NA | 1   | 1   | STD83478  | 08/31/17 14:11 |
| 8M421175 | RINSE                             | NA | 1   | 1   | STD83388  | 08/31/17 14:36 |
| 8M421176 | WG628027-02 5ug/L A9FOO STD       | NA | 1   | 1   | STD83554  | 08/31/17 15:06 |
| 8M421177 | WG628027-03 20ug/L A9FOO STD      | NA | 1   | 1   | STD83554  | 08/31/17 15:36 |
| 8M421178 | WG628027-04 50ug/L A9FOO STD      | NA | 1   | 1   | STD83554  | 08/31/17 16:05 |
| 8M421179 | WG628027-05 100ug/L A9FOO STD     | NA | 1   | 1   | STD83554  | 08/31/17 16:35 |
| 8M421180 | WG628027-06 200ug/L A9FOO STD     | NA | 1   | 1   | STD83554  | 08/31/17 17:04 |
| 8M421181 | WG628027-07 300ug/L A9FOO STD     | NA | 1   | 1   | STD83554  | 08/31/17 17:34 |
| 8M421182 | WG628027-08 400ug/L A9FOO STD     | NA | 1   | 1   | STD83554  | 08/31/17 18:04 |
| 8M421183 | WG628027-09 500ug/L A9FOO STD     | NA | 1   | 1   | STD83554  | 08/31/17 18:33 |
| 8M421184 | RINSE                             | NA | 1   | 1   | STD83554  | 08/31/17 19:03 |
| 8M421185 | WG628027-10 100ug/L A9FOO ALT SRC | NA | 1   | 1   | STD83193  | 08/31/17 19:33 |

Comments

| Seq.              | Rerun | Dil. | Reason | Analytes |
|-------------------|-------|------|--------|----------|
| 1                 | X     |      |        |          |
| File ID: 8M421173 |       |      |        |          |
| Tune failed, DNR. |       |      |        |          |

Approved: September 05, 2017

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## Microbac Laboratories Inc.

## Instrument Run Log

|                     |                  |           |                  |
|---------------------|------------------|-----------|------------------|
| Instrument:         | HPMS8            | Dataset:  | 091317           |
| Analyst1:           | TMB              | Analyst2: | NA               |
| Method:             | 8260B            | SOP:      | MSV01/OVAP MSV01 |
| Method:             | 624              | SOP:      | MSV10            |
| Method:             | 530B/5030C/5035A | SOP:      | PAT01/OVAP PAT01 |
| Maintenance Log ID: | 54316            |           | Rev: 25/0        |
|                     |                  |           | Rev: 15          |
|                     |                  |           | Rev: 18/1        |

|                    |          |                     |          |
|--------------------|----------|---------------------|----------|
| Internal Standard: | STD83648 | Surrogate Standard: | STD83648 |
| CCV:               | STD83834 | LCS:                | STD83830 |
| Column 1 ID:       | RTX502.2 | Column 2 ID:        | NA       |
| Workgroups:        | WG629567 |                     |          |

Comments:

| File ID  | Sample Information                  | pH | Mat | Dil | Reference | Date/Time      |
|----------|-------------------------------------|----|-----|-----|-----------|----------------|
| 8M421377 | WG629567-01 50ng BFB STD 8260       | NA | 1   | 1   | STD83478  | 09/13/17 14:18 |
| 8M421378 | RINSE                               | NA | 1   | 1   | STD83478  | 09/13/17 14:44 |
| 8M421379 | WG629567-02 0.3ug/L STD 8260        | NA | 1   | 1   | STD83834  | 09/13/17 15:15 |
| 8M421380 | WG629567-03 0.4ug/L STD 8260        | NA | 1   | 1   | STD83834  | 09/13/17 15:44 |
| 8M421381 | WG629567-04 1ug/L STD 8260          | NA | 1   | 1   | STD83834  | 09/13/17 16:17 |
| 8M421382 | WG629567-05 2ug/L STD 8260          | NA | 1   | 1   | STD83834  | 09/13/17 16:49 |
| 8M421383 | WG629567-06 5ug/L STD 8260          | NA | 1   | 1   | STD83834  | 09/13/17 17:17 |
| 8M421384 | WG629567-07 20ug/L STD 8260         | NA | 1   | 1   | STD83834  | 09/13/17 17:46 |
| 8M421385 | WG629567-08 50ug/L STD 8260         | NA | 1   | 1   | STD83834  | 09/13/17 18:15 |
| 8M421386 | WG629567-09 100ug/L STD 8260        | NA | 1   | 1   | STD83834  | 09/13/17 18:44 |
| 8M421387 | WG629567-10 200ug/L STD 8260        | NA | 1   | 1   | STD83834  | 09/13/17 19:13 |
| 8M421388 | WG629567-11 300ug/L STD 8260        | NA | 1   | 1   | STD83834  | 09/13/17 19:41 |
| 8M421389 | RINSE                               | NA | 1   | 1   |           | 09/13/17 20:11 |
| 8M421390 | RINSE                               | NA | 1   | 1   |           | 09/13/17 20:40 |
| 8M421391 | WG629567-12 50ug/L ALT SRC STD 8260 | NA | 1   | 1   | STD83830  | 09/13/17 21:09 |
| 8M421392 | CCV CHECK                           | NA | 1   | 1   | STD83834  | 09/13/17 21:38 |
| 8M421393 | RINSE                               | NA | 1   | 1   |           | 09/13/17 22:06 |

Approved: September 14, 2017

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## Microbac Laboratories Inc.

## Instrument Run Log

|                     |                   |           |                  |
|---------------------|-------------------|-----------|------------------|
| Instrument:         | HPMS8             | Dataset:  | 100417           |
| Analyst1:           | HRF               | Analyst2: | ADC              |
| Method:             | 8260B             | SOP:      | MSV01/OVAP MSV01 |
| Method:             | 624               | SOP:      | MSV10            |
| Method:             | 5030B/5030C/5035A | SOP:      | PAT01/OVAP PAT01 |
| Maintenance Log ID: | 54346             |           | Rev: 25/0        |
|                     |                   |           | Rev: 15          |
|                     |                   |           | Rev: 18/1        |

Internal Standard: STD84119 Surrogate Standard: STD84119  
 CCV: STD84160 LCS: STD84177 MS/MSD: STD84177

Column 1 ID: RTX502.2 Column 2 ID: NA  
 Workgroups: WG632478

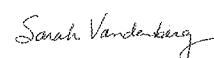
Comments: All 1702s 01 through 10 were run at 10x and were too dilute. RR. STR.

| File ID  | Sample Information                  | pH | Mat | Dil | Reference | Date/Time      |
|----------|-------------------------------------|----|-----|-----|-----------|----------------|
| 8M421914 | WG632477-01 50ng BFB STD 8260       | NA | 1   | 1   | STD84001  | 10/04/17 11:29 |
| 8M421915 | WG632477-02 50ug/L CCV STD 8260     | NA | 1   | 1   | STD84172  | 10/04/17 11:55 |
| 8M421916 | WG000000-01 100ug/L A9 CCV STD 8260 | NA | 1   | 1   | STD84099  | 10/04/17 12:25 |
| 8M421917 | RINSE                               | NA | 1   | 1   |           | 10/04/17 12:57 |
| 8M421918 | WG632478-01 BLK1004 STD 8260        | NA | 1   | 1   |           | 10/04/17 13:26 |
| 8M421919 | L17091702-11 TB 826-SPE             | <2 | 1   | 1   |           | 10/04/17 13:56 |
| 8M421920 | WG632478-02 20ug/L LCS STD 8260     | NA | 1   | 1   | STD84177  | 10/04/17 14:25 |
| 8M421921 | L17091702-04 MS 20ug/mL 826-SPE     | <2 | 1   | 10  | STD84177  | 10/04/17 14:55 |
| 8M421922 | L17091702-05 MSD 20ug/mL 826-SPE    | <2 | 1   | 10  | STD84177  | 10/04/17 15:25 |
| 8M421923 | L17091759-17 B 10X 826-SPE          | 7  | 1   | 10  |           | 10/04/17 15:55 |
| 8M421924 | L17091702-03 A REF 10X 826-SPE      | <2 | 1   | 10  |           | 10/04/17 16:24 |
| 8M421925 | L17091752-59 A 826-SPE              | 7  | 1   | 1   |           | 10/04/17 16:54 |
| 8M421926 | L17091752-62 A 826-SPE              | 7  | 1   | 1   |           | 10/04/17 17:24 |
| 8M421927 | L17091752-63 A 826-SPE              | 6  | 1   | 1   |           | 10/04/17 17:53 |
| 8M421928 | L17091752-64 A 826-SPE              | 6  | 1   | 1   |           | 10/04/17 18:24 |
| 8M421929 | L17091752-65 A 826-SPE              | 6  | 1   | 1   |           | 10/04/17 18:54 |
| 8M421930 | L17091752-60 A 2x 826-SPE           | 7  | 1   | 2   |           | 10/04/17 19:24 |
| 8M421931 | L17091752-61 A 5x 826-SPE           | 6  | 1   | 5   |           | 10/04/17 19:56 |
| 8M421932 | L17091702-01 A 10x 826-SPE          | <2 | 1   | 10  |           | 10/04/17 20:28 |
| 8M421933 | L17091702-02 A 10x 826-SPE          | <2 | 1   | 10  |           | 10/04/17 20:57 |
| 8M421934 | L17091702-06 A 10x 826-SPE          | <2 | 1   | 10  |           | 10/04/17 21:27 |
| 8M421935 | L17091702-07 A 10x 826-SPE          | <2 | 1   | 10  |           | 10/04/17 22:01 |
| 8M421936 | L17091702-08 A 10x 826-SPE          | <2 | 1   | 10  |           | 10/04/17 22:30 |
| 8M421937 | L17091702-09 A 10x 826-SPE          | <2 | 1   | 10  |           | 10/04/17 23:03 |
| 8M421938 | L17091702-10 A 10x 826-SPE          | <2 | 1   | 10  |           | 10/04/17 23:33 |
| 8M421939 | RINSE                               | NA | 1   | 1   |           | 10/05/17 00:08 |
| 8M421940 | WG632478-06 BLANK2 624-SPE          | NA | 2   | 1   |           | 10/05/17 00:39 |
| 8M421941 | L17100224-01 A 10X AF 624-SPE       | 7  | 2   | 10  |           | 10/05/17 01:14 |
| 8M421942 | CCV                                 | NA | 1   | 1   |           | 10/05/17 01:44 |
| 8M421943 | RINSE                               | NA | 1   | 1   |           | 10/05/17 02:13 |
| 8M421944 | RINSE                               | NA | 1   | 1   |           | 10/05/17 02:44 |

Comments

Approved: October 05, 2017

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## Microbac Laboratories Inc.

## Instrument Run Log

|                                  |                              |
|----------------------------------|------------------------------|
| Instrument: <u>HPMS8</u>         | Dataset: <u>100417</u>       |
| Analyst1: <u>HRF</u>             | Analyst2: <u>ADC</u>         |
| Method: <u>8260B</u>             | SOP: <u>MSV01/OVAP MSV01</u> |
| Method: <u>624</u>               | SOP: <u>MSV10</u>            |
| Method: <u>5030B/5030C/5035A</u> | SOP: <u>PAT01/OVAP PAT01</u> |
| Maintenance Log ID: <u>54346</u> | Rev: <u>25/0</u>             |
|                                  | Rev: <u>15</u>               |
|                                  | Rev: <u>18/1</u>             |

Internal Standard: STD84119 Surrogate Standard: STD84119  
 CCV: STD84160 LCS: STD84177 MS/MSD: STD84177

Column 1 ID: RTX502.2 Column 2 ID: NA  
 Workgroups: WG632478

Comments: All 1702s 01 through 10 were run at 10x and were too dilute. RR. STR.

Comments

| Seq. | Rerun | Dil. | Reason                 | Analytes |
|------|-------|------|------------------------|----------|
| 17   | X     | 10   | Over Calibration Range | tce      |
|      |       |      | File ID: 8M421930      |          |
|      |       |      | L17091752-60           |          |
| 18   | X     |      | Analyzed too dilute    |          |
|      |       |      | File ID: 8M421931      |          |
|      |       |      | L17091752-61           |          |

Approved: October 05, 2017

Sarah Vandenberg

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## Microbac Laboratories Inc.

## Instrument Run Log

|                     |                   |           |                  |
|---------------------|-------------------|-----------|------------------|
| Instrument:         | HPMS8             | Dataset:  | 100517           |
| Analyst1:           | HRF               | Analyst2: | NA               |
| Method:             | 8260B             | SOP:      | MSV01/OVAP MSV01 |
| Method:             | 624               | SOP:      | MSV10            |
| Method:             | 5030B/5030C/5035A | SOP:      | PAT01/OVAP PAT01 |
| Maintenance Log ID: |                   | Rev:      | 25/0             |
|                     |                   | Rev:      | 15               |
|                     |                   | Rev:      | 18/1             |

Maintenance Log ID: \_\_\_\_\_

Internal Standard: STD84119 Surrogate Standard: STD84119  
 CCV: STD84172 LCS: STD84177 MS/MSD: STD84177

Column 1 ID: RTX502.2 Column 2 ID: NA  
 Workgroups: WG632680

Comments: \_\_\_\_\_

| File ID  | Sample Information                  | pH | Mat | Dil | Reference | Date/Time      |
|----------|-------------------------------------|----|-----|-----|-----------|----------------|
| 8M421945 | WG632679-01 50ng BFB STD 8260       | NA | 1   | 1   | STD84001  | 10/05/17 09:35 |
| 8M421946 | WG632679-02 50ug/L CCV STD 8260     | NA | 1   | 1   | STD84172  | 10/05/17 10:00 |
| 8M421947 | WG000000-01 100ug/L A9 CCV STD 8260 | NA | 1   | 1   | STD84099  | 10/05/17 10:31 |
| 8M421948 | RINSE                               | NA | 1   | 1   |           | 10/05/17 11:01 |
| 8M421949 | WG632680-01 BLK1004 STD 8260        | NA | 1   | 1   |           | 10/05/17 11:31 |
| 8M421950 | WG632680-02 20ug/L LCS STD 8260     | NA | 1   | 1   | STD84177  | 10/05/17 12:00 |
| 8M421951 | L17091702-04 B MS 20ug/L 826-SPE    | <2 | 1   | 1   | STD84177  | 10/05/17 12:31 |
| 8M421952 | L17091702-05 B MSD 20ug/L 826-SPE   | <2 | 1   | 1   | STD84177  | 10/05/17 13:02 |
| 8M421953 | L17091752-60 B 10X 826-SPE          | 6  | 1   | 10  |           | 10/05/17 13:32 |
| 8M421954 | L17091702-03 B REF 826-SPE          | <2 | 1   | 1   |           | 10/05/17 14:02 |
| 8M421955 | L17091752-61 B 826-SPE              | 6  | 1   | 1   |           | 10/05/17 14:32 |
| 8M421956 | L17091702-01 B 826-SPE              | <2 | 1   | 1   |           | 10/05/17 15:02 |
| 8M421957 | L17091702-02 B 826-SPE              | <2 | 1   | 1   |           | 10/05/17 15:33 |
| 8M421958 | L17091702-06 B 826-SPE              | <2 | 1   | 1   |           | 10/05/17 16:02 |
| 8M421959 | L17091702-07 B 826-SPE              | <2 | 1   | 1   |           | 10/05/17 16:32 |
| 8M421960 | L17091702-08 B 826-SPE              | <2 | 1   | 1   |           | 10/05/17 17:01 |
| 8M421961 | L17091702-09 B 826-SPE              | <2 | 1   | 1   |           | 10/05/17 17:31 |
| 8M421962 | L17091702-10 B 826-SPE              | <2 | 1   | 1   |           | 10/05/17 18:00 |
| 8M421963 | L17091705-02 A TB 826-SPE           | <2 | 1   | 1   |           | 10/05/17 18:30 |
| 8M421964 | L17100068-04 A 826-SPE              | <2 | 1   | 1   |           | 10/05/17 19:00 |
| 8M421965 | L17091705-01 A 826-SPE              | <2 | 1   | 1   |           | 10/05/17 19:30 |
| 8M421966 | L17100068-01 A 826-SPE              | <2 | 1   | 1   |           | 10/05/17 20:00 |
| 8M421967 | L17100068-02 A 826-SPE              | <2 | 1   | 1   |           | 10/05/17 20:30 |
| 8M421968 | L17100068-03 A 826-SPE              | <2 | 1   | 1   |           | 10/05/17 21:01 |
| 8M421969 | CCV                                 | NA | 1   | 1   |           | 10/05/17 21:33 |
| 8M421970 | RINSE                               | NA | 1   | 1   |           | 10/05/17 22:03 |
| 8M421971 | RINSE                               | NA | 1   | 1   |           | 10/05/17 22:34 |

Comments

| Seq.              | Rerun | Dil. | Reason | Analytes |
|-------------------|-------|------|--------|----------|
| 3                 |       |      |        |          |
| File ID: 8M421947 |       |      |        |          |
| Not needed, DNR.  |       |      |        |          |

Approved: October 09, 2017

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## Microbac Laboratories Inc.

## Data Checklist

Date: 31-AUG-2017

Analyst: ADC

Analyst: NA

Method: 8260B/624/OVAP

Instrument: HPMS8

Curve Workgroup: NA

Runlog ID: 84380

Analytical Workgroups: WG628027

|  |     |
|--|-----|
| System Performance Check   | NA  |
| BFB  | X   |
| Initial Calibration  | X   |
| Average RF   | X   |
| Linear Reg or Higher Order Curve                                   | X   |
| Second Source standard % Difference                                | X   |
| Continuing Calibration /Check Standards                            | X   |
| Project/Client Specific Requirements                               | X   |
| Special Standards  | X   |
| Blanks   | X   |
| TCL's  | X   |
| Surrogates   | X   |
| LCS (Laboratory Control Sample)                                    | X   |
| Recoveries   | X   |
| Surrogates   | X   |
| MS/MSD/Duplicates  | NA  |
| Samples  | X   |
| TCL Hits   | X   |
| Spectra of TCL Hits  | TMB |
| Surrogates   | X   |
| Internal Standards Criteria  | X   |
| Library Searches   | NA  |
| Calculations & Correct Factors                                     | X   |
| Dilutions Run  | NA  |
| Reruns   | NA  |
| Manual Integrations  | NA  |
| Case Narrative   | X   |
| Results Reporting/Data Qualifiers                                  | X   |
| KOBRA Workgroup Data   | X   |
| Check for Completeness   | X   |
| Primary Reviewer   | TMB |
| Secondary Reviewer   | ADC |
|  |     |
| Check for compliance with method and project specific requirements | X   |
| Check the completeness of reported information                     | X   |
| Check the information for the report narrative                     | X   |
| Check the reasonableness of the results                            | X   |

Primary Reviewer:  
05-SEP-2017Secondary Reviewer:  
05-SEP-2017*Tiffany Bailey**Alyx Carter*

## Microbac Laboratories Inc.

## Data Checklist

Date: 13-SEP-2017

Analyst: TMB

Analyst: NA

Method: 8260B/624/OVAP

Instrument: HPMS8

Curve Workgroup: NA

Runlog ID: 84588

Analytical Workgroups: WG629567

|  |     |
|--|-----|
| System Performance Check   | NA  |
| BFB  | X   |
| Initial Calibration  | X   |
| Average RF   | X   |
| Linear Reg or Higher Order Curve                                   | X   |
| Second Source standard % Difference                                | X   |
| Continuing Calibration /Check Standards                            | X   |
| Project/Client Specific Requirements                               | X   |
| Special Standards  | X   |
| Blanks   | X   |
| TCL's  | X   |
| Surrogates   | X   |
| LCS (Laboratory Control Sample)                                    | X   |
| Recoveries   | X   |
| Surrogates   | X   |
| MS/MSD/Duplicates  | NA  |
| Samples  | X   |
| TCL Hits   | X   |
| Spectra of TCL Hits  | TMB |
| Surrogates   | X   |
| Internal Standards Criteria  | X   |
| Library Searches   | NA  |
| Calculations & Correct Factors                                     | X   |
| Dilutions Run  | NA  |
| Reruns   | NA  |
| Manual Integrations  | NA  |
| Case Narrative   | X   |
| Results Reporting/Data Qualifiers                                  | X   |
| KOBRA Workgroup Data   | X   |
| Check for Completeness   | X   |
| Primary Reviewer   | TMB |
| Secondary Reviewer   | ADC |
|  |     |
| Check for compliance with method and project specific requirements | X   |
| Check the completeness of reported information                     | X   |
| Check the information for the report narrative                     | X   |
| Check the reasonableness of the results                            | X   |

Primary Reviewer:  
14-SEP-2017Secondary Reviewer:  
14-SEP-2017*Tiffany Bailey**Ashley Carter*

## Microbac Laboratories Inc.

## Data Checklist

Date: 04-OCT-2017

Analyst: HRF

Analyst: ADC

Method: 8260

Instrument: HPMS8

Curve Workgroup: NA

Runlog ID: 85054

Analytical Workgroups: WG632478

|  |     |
|--|-----|
| System Performance Check   |     |
| BFB  | NA  |
| Initial Calibration  |     |
| Average RF   | X   |
| Linear Reg or Higher Order Curve                                   | X   |
| Second Source standard % Difference                                | X   |
| Continuing Calibration /Check Standards                            | X   |
| Project/Client Specific Requirements                               | X   |
| Special Standards  | NA  |
| Blanks   | X   |
| TCL's  | X   |
| Surrogates   | X   |
| LCS (Laboratory Control Sample)                                    | X   |
| Recoveries   | X   |
| Surrogates   | X   |
| MS/MSD/Duplicates  | X   |
| Samples  | X   |
| TCL Hits   | X   |
| Spectra of TCL Hits  | ADC |
| Surrogates   | X   |
| Internal Standards Criteria  | X   |
| Library Searches   | NA  |
| Calculations & Correct Factors                                     | X   |
| Dilutions Run  | X   |
| Reruns   | X   |
| Manual Integrations  | NA  |
| Case Narrative   | X   |
| Results Reporting/Data Qualifiers                                  | X   |
| KOBRA Workgroup Data   | X   |
| Check for Completeness   | X   |
| Primary Reviewer   | ADC |
| Secondary Reviewer   | SAV |
| Check for compliance with method and project specific requirements |     |
| Check the completeness of reported information                     | X   |
| Check the information for the report narrative                     | X   |
| Check the reasonableness of the results                            | X   |

Primary Reviewer:  
05-OCT-2017Secondary Reviewer:  
05-OCT-2017

## Microbac Laboratories Inc.

## Data Checklist

Date: 05-OCT-2017

Analyst: HRF

Analyst: NA

Method: 8260B/624/OVAP

Instrument: HPMS8

Curve Workgroup: NA

Runlog ID: 85121

Analytical Workgroups: WG632680

|  |     |
|--|-----|
| System Performance Check   |     |
| BFB  | NA  |
| Initial Calibration  |     |
| Average RF   | X   |
| Linear Reg or Higher Order Curve                                   | X   |
| Second Source standard % Difference                                | X   |
| Continuing Calibration /Check Standards                            | X   |
| Project/Client Specific Requirements                               | X   |
| Special Standards  | NA  |
| Blanks   | X   |
| TCL's  | X   |
| Surrogates   | X   |
| LCS (Laboratory Control Sample)                                    | X   |
| Recoveries   | X   |
| Surrogates   | X   |
| MS/MSD/Duplicates  | X   |
| Samples  | X   |
| TCL Hits   | X   |
| Spectra of TCL Hits  | TMB |
| Surrogates   | X   |
| Internal Standards Criteria  | X   |
| Library Searches   | NA  |
| Calculations & Correct Factors                                     | X   |
| Dilutions Run  | X   |
| Reruns   | X   |
| Manual Integrations  | NA  |
| Case Narrative   | X   |
| Results Reporting/Data Qualifiers                                  | X   |
| KOBRA Workgroup Data   | X   |
| Check for Completeness   | X   |
| Primary Reviewer   | TMB |
| Secondary Reviewer   | ADC |
|  |     |
| Check for compliance with method and project specific requirements |     |
| Check the completeness of reported information                     | X   |
| Check the information for the report narrative                     | X   |
| Check the reasonableness of the results                            | X   |

Primary Reviewer:  
09-OCT-2017Secondary Reviewer:  
09-OCT-2017*Tiffany Bailey**Ashley Carter*

Microbac Laboratories Inc.  
HOLDING TIMES  
EQUIVALENT TO AFCEE FORM 9

Analytical Method: 8260B  
Login Number: L17091702

AAB# : WG632478

| Client ID   | ID | Date Collected | TCLP Date | Time Held | Max Hold | Q | Extract Date | Time Held | Max Hold | Q | Run Date | Time Held | Max Hold | Q |
|-------------|----|----------------|-----------|-----------|----------|---|--------------|-----------|----------|---|----------|-----------|----------|---|
| TB01-092717 | 11 | 09/27/17       |           |           |          |   | 10/04/2017   | 6.8       | 14       |   | 10/04/17 | 6.8       | 14       |   |

\* = SEE PROJECT QAPP REQUIREMENTS

HOLD\_TIMES - Modified 03/06/2008  
PDF File ID: 5511176  
Report generated 10/09/2017 12:29



Microbac Laboratories Inc.  
HOLDING TIMES  
EQUIVALENT TO AFCEE FORM 9

Analytical Method: 8260B  
Login Number: L17091702

AAB# : WG632680

| Client ID        | ID | Date Collected | TCLP Date | Time Held | Max Hold | Q | Extract Date | Time Held | Max Hold | Q | Run Date | Time Held | Max Hold | Q |
|------------------|----|----------------|-----------|-----------|----------|---|--------------|-----------|----------|---|----------|-----------|----------|---|
| 0293-PW-092617   | 01 | 09/26/17       |           |           |          |   | 10/05/2017   | 9         | 14       |   | 10/05/17 | 9         | 14       |   |
| 0293-PW-092617D  | 02 | 09/26/17       |           |           |          |   | 10/05/2017   | 9         | 14       |   | 10/05/17 | 9         | 14       |   |
| 0297-PW-092617   | 03 | 09/26/17       |           |           |          |   | 10/05/2017   | 8.9       | 14       |   | 10/05/17 | 8.9       | 14       |   |
| 0297-PW-092617MS | 04 | 09/26/17       |           |           |          |   | 10/05/2017   | 8.9       | 14       |   | 10/05/17 | 8.9       | 14       |   |
| 0297-PW-092617SD | 05 | 09/26/17       |           |           |          |   | 10/05/2017   | 8.9       | 14       |   | 10/05/17 | 8.9       | 14       |   |
| 0019-PW-092717   | 06 | 09/27/17       |           |           |          |   | 10/05/2017   | 8.2       | 14       |   | 10/05/17 | 8.2       | 14       |   |
| 0298-PW-092717   | 07 | 09/27/17       |           |           |          |   | 10/05/2017   | 8.2       | 14       |   | 10/05/17 | 8.2       | 14       |   |
| 0300-PW-092717   | 08 | 09/27/17       |           |           |          |   | 10/05/2017   | 8.1       | 14       |   | 10/05/17 | 8.1       | 14       |   |
| 0301-PW-092717   | 09 | 09/27/17       |           |           |          |   | 10/05/2017   | 8.1       | 14       |   | 10/05/17 | 8.1       | 14       |   |
| 0305-PW-092717   | 10 | 09/27/17       |           |           |          |   | 10/05/2017   | 8         | 14       |   | 10/05/17 | 8         | 14       |   |

\* = SEE PROJECT QAPP REQUIREMENTS

HOLD\_TIMES - Modified 03/06/2008  
PDF File ID: 5511176  
Report generated 10/09/2017 12:29



Microbac Laboratories Inc.  
SURROGATE STANDARDS

Login Number:L17091702  
Instrument Id:HPMS8  
Workgroup (AAB#):WG632478

Method:8260  
CAL ID: HPMS8 - 13-SEP-17  
Matrix:Water

| Sample Number | Dilution | Tag | 1    | 2    | 3    | 4    |
|---------------|----------|-----|------|------|------|------|
| L17091702-11  | 1.00     | 01  | 93.4 | 93.0 | 98.6 | 96.6 |
| WG632478-01   | 1.00     | 01  | 92.4 | 93.5 | 101  | 96.2 |
| WG632478-02   | 1.00     | 01  | 94.8 | 94.1 | 99.0 | 97.6 |
| WG632478-06   | 1.00     | 01  | 95.0 | 92.8 | 98.0 | 96.3 |

| Surrogates                | Surrogate Limits |   |     |
|---------------------------|------------------|---|-----|
| 1 - 1,2-Dichloroethane-d4 | 70               | - | 120 |
| 2 - Dibromofluoromethane  | 85               | - | 115 |
| 3 - 4-Bromofluorobenzene  | 75               | - | 120 |
| 4 - Toluene-d8            | 85               | - | 120 |

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected

SURROGATES - Modified 03/06/2008  
PDF File ID: 5511220  
Report generated: 10/09/2017 12:29



Microbac Laboratories Inc.  
SURROGATE STANDARDS

Login Number:L17091702  
Instrument Id:HPMS8  
Workgroup (AAB#):WG632680

Method:8260  
CAL ID: HPMS8 - 13-SEP-17  
Matrix:Water

| Sample Number | Dilution | Tag | 1    | 2    | 3    | 4    |
|---------------|----------|-----|------|------|------|------|
| L17091702-01  | 1.00     | 01  | 91.8 | 91.4 | 99.3 | 94.8 |
| L17091702-02  | 1.00     | 01  | 92.8 | 92.3 | 96.1 | 96.7 |
| L17091702-03  | 1.00     | 01  | 94.6 | 93.9 | 97.6 | 96.6 |
| L17091702-04  | 1.00     | 01  | 93.2 | 93.3 | 98.6 | 95.4 |
| L17091702-05  | 1.00     | 01  | 91.7 | 94.2 | 97.5 | 95.1 |
| L17091702-06  | 1.00     | 01  | 94.2 | 93.6 | 96.4 | 94.5 |
| L17091702-07  | 1.00     | 01  | 91.3 | 93.1 | 96.1 | 95.5 |
| L17091702-08  | 1.00     | 01  | 90.7 | 91.3 | 97.5 | 95.7 |
| L17091702-09  | 1.00     | 01  | 91.0 | 92.4 | 97.6 | 96.3 |
| L17091702-10  | 1.00     | 01  | 93.2 | 93.9 | 98.5 | 95.1 |
| WG632680-01   | 1.00     | 01  | 95.1 | 93.0 | 98.9 | 94.5 |
| WG632680-02   | 1.00     | 01  | 93.4 | 93.7 | 98.5 | 97.4 |

| Surrogates                | Surrogate Limits |   |     |
|---------------------------|------------------|---|-----|
| 1 - 1,2-Dichloroethane-d4 | 70               | - | 120 |
| 2 - Dibromofluoromethane  | 85               | - | 115 |
| 3 - 4-Bromofluorobenzene  | 75               | - | 120 |
| 4 - Toluene-d8            | 85               | - | 120 |

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected

SURROGATES - Modified 03/06/2008  
PDF File ID: 5511220  
Report generated: 10/09/2017 12:29



## METHOD BLANK SUMMARY

Login Number:L17091702 Work Group:WG632478  
Blank File ID:8M421918 Blank Sample ID:WG632478-01  
Prep Date:10/04/17 13:26 Instrument ID:HPMS8  
Analyzed Date:10/04/17 13:26 Method:8260B  
Analyst:HRF

This Method Blank Applies To The Following Samples:

| Client ID   | Lab Sample ID | Lab File ID | Time Analyzed  | TAG |
|-------------|---------------|-------------|----------------|-----|
| TB01-092717 | L17091702-11  | 8M421919    | 10/04/17 13:56 | 01  |
| LCS         | WG632478-02   | 8M421920    | 10/04/17 14:25 | 01  |

Report Name: BLANK\_SUMMARY  
PDF File ID: 5511187  
Report generated 10/10/2017 16:26



## METHOD BLANK SUMMARY

Login Number:L17091702 Work Group:WG632680  
 Blank File ID:8M421949 Blank Sample ID:WG632680-01  
 Prep Date:10/05/17 11:31 Instrument ID:HPMS8  
 Analyzed Date:10/05/17 11:31 Method:8260B  
 Analyst:HRF

This Method Blank Applies To The Following Samples:

| Client ID        | Lab Sample ID | Lab File ID | Time Analyzed  | TAG |
|------------------|---------------|-------------|----------------|-----|
| LCS              | WG632680-02   | 8M421950    | 10/05/17 12:00 | 01  |
| 0297-PW-092617MS | L17091702-04  | 8M421951    | 10/05/17 12:31 | 01  |
| 0297-PW-092617SD | L17091702-05  | 8M421952    | 10/05/17 13:02 | 01  |
| 0297-PW-092617   | L17091702-03  | 8M421954    | 10/05/17 14:02 | 01  |
| 0293-PW-092617   | L17091702-01  | 8M421956    | 10/05/17 15:02 | 01  |
| 0293-PW-092617D  | L17091702-02  | 8M421957    | 10/05/17 15:33 | 01  |
| 0019-PW-092717   | L17091702-06  | 8M421958    | 10/05/17 16:02 | 01  |
| 0298-PW-092717   | L17091702-07  | 8M421959    | 10/05/17 16:32 | 01  |
| 0300-PW-092717   | L17091702-08  | 8M421960    | 10/05/17 17:01 | 01  |
| 0301-PW-092717   | L17091702-09  | 8M421961    | 10/05/17 17:31 | 01  |
| 0305-PW-092717   | L17091702-10  | 8M421962    | 10/05/17 18:00 | 01  |

Report Name: BLANK\_SUMMARY  
 PDF File ID: 5511187  
 Report generated 10/10/2017 16:26



## Microbac Laboratories Inc.

## METHOD BLANK REPORT

Login Number:L17091702 Prep Date:10/04/17 13:26 Sample ID:WG632478-01  
 Instrument ID:HPMS8 Run Date:10/04/17 13:26 Prep Method:5030B/5030C/503  
 File ID:8M421918 Analyst:HRF Method:8260B  
 Workgroup (AAB#):WG632478 Matrix:Water Units:ug/L  
 Contract #: \_\_\_\_\_ Cal ID: HPMS8 - 13-SEP-17

| Analytes                  | MDL   | RL   | Concentration | Dilution | Qualifier |
|---------------------------|-------|------|---------------|----------|-----------|
| 1,1,2,2-Tetrachloroethane | 0.200 | 1.00 | 1.00          | 1        | U         |
| 1,1,2-Trichloroethane     | 0.250 | 1.00 | 1.00          | 1        | U         |
| 1,1-Dichloroethane        | 0.125 | 1.00 | 1.00          | 1        | U         |
| 1,1-Dichloroethene        | 0.500 | 1.00 | 1.00          | 1        | U         |
| 1,2-Dichloroethane        | 0.250 | 1.00 | 1.00          | 1        | U         |
| 1,2-Dichloropropane       | 0.200 | 1.00 | 1.00          | 1        | U         |
| 1,2,4-Trimethylbenzene    | 0.250 | 1.00 | 1.00          | 1        | U         |
| 1,4-Dichlorobenzene       | 0.125 | 1.00 | 1.00          | 1        | U         |
| 1,3,5-Trimethylbenzene    | 0.250 | 1.00 | 1.00          | 1        | U         |
| 1,3-Dichlorobenzene       | 0.250 | 1.00 | 1.00          | 1        | U         |
| 2-Butanone                | 2.50  | 5.00 | 5.00          | 1        | U         |
| 4-Methyl-2-pentanone      | 2.50  | 5.00 | 5.00          | 1        | U         |
| Acetone                   | 2.50  | 5.00 | 5.00          | 1        | U         |
| 2-Hexanone                | 2.50  | 5.00 | 5.00          | 1        | U         |
| Benzene                   | 0.125 | 1.00 | 1.00          | 1        | U         |
| Bromodichloromethane      | 0.250 | 1.00 | 1.00          | 1        | U         |
| Bromomethane              | 0.500 | 1.00 | 1.00          | 1        | U         |
| Carbon disulfide          | 0.500 | 1.00 | 1.00          | 1        | U         |
| Carbon tetrachloride      | 0.250 | 1.00 | 1.00          | 1        | U         |
| Chlorobenzene             | 0.125 | 1.00 | 1.00          | 1        | U         |
| Chloroform                | 0.125 | 1.00 | 1.00          | 1        | U         |
| Dibromochloromethane      | 0.250 | 1.00 | 1.00          | 1        | U         |
| Dichlorodifluoromethane   | 0.250 | 1.00 | 1.00          | 1        | U         |
| Chloromethane             | 0.500 | 1.00 | 1.00          | 1        | U         |
| cis-1,2-Dichloroethene    | 0.250 | 1.00 | 1.00          | 1        | U         |
| Diethyl ether             | 5.00  | 10.0 | 10.0          | 1        | U         |
| Ethylbenzene              | 0.250 | 1.00 | 1.00          | 1        | U         |
| Methylene chloride        | 0.250 | 1.00 | 1.00          | 1        | U         |
| Naphthalene               | 0.200 | 1.00 | 1.00          | 1        | U         |
| Styrene                   | 0.125 | 1.00 | 1.00          | 1        | U         |
| Tetrachloroethene         | 0.250 | 1.00 | 1.00          | 1        | U         |
| Toluene                   | 0.250 | 1.00 | 1.00          | 1        | U         |
| trans-1,2-Dichloroethene  | 0.250 | 1.00 | 1.00          | 1        | U         |
| Trichloroethene           | 0.250 | 1.00 | 1.00          | 1        | U         |
| Trichlorofluoromethane    | 0.250 | 1.00 | 1.00          | 1        | U         |
| Vinyl chloride            | 0.250 | 1.00 | 1.00          | 1        | U         |
| Xylenes                   | 0.500 | 1.00 | 1.00          | 1        | U         |

Report Name:BLANK  
 PDF ID: 5511188  
 09-OCT-2017 12:29



Microbac Laboratories Inc.  
METHOD BLANK REPORT

Login Number:L17091702 Prep Date:10/04/17 13:26 Sample ID:WG632478-01  
Instrument ID:HPMS8 Run Date:10/04/17 13:26 Prep Method:5030B/5030C/503  
File ID:8M421918 Analyst:HRF Method:8260B  
Workgroup (AAB#):WG632478 Matrix:Water Units:ug/L  
Contract #: \_\_\_\_\_ Cal ID: HPMS8 - 13-SEP-17

| Surrogates            | % Recovery | Surrogate Limits |   | Qualifier |      |
|-----------------------|------------|------------------|---|-----------|------|
| 1,2-Dichloroethane-d4 | 92.4       | 70               | - | 120       | PASS |
| 4-Bromofluorobenzene  | 101        | 75               | - | 120       | PASS |
| Dibromofluoromethane  | 93.5       | 85               | - | 115       | PASS |
| Toluene-d8            | 96.2       | 85               | - | 120       | PASS |

MDL Method Detection Limit

RL Reporting/Practical Quantitation Limit

ND Analyte Not detected at or above reporting limit

\* |Analyte concentration| > RL

Report Name:BLANK  
PDF ID: 5511188  
09-OCT-2017 12:29



## Microbac Laboratories Inc.

## METHOD BLANK REPORT

Login Number:L17091702 Prep Date:10/05/17 11:31 Sample ID:WG632680-01  
 Instrument ID:HPMS8 Run Date:10/05/17 11:31 Prep Method:5030B/5030C/503  
 File ID:8M421949 Analyst:HRF Method:8260B  
 Workgroup (AAB#):WG632680 Matrix:Water Units:ug/L  
 Contract #: \_\_\_\_\_ Cal ID: HPMS8 - 13-SEP-17

| Analytes                  | MDL   | RL   | Concentration | Dilution | Qualifier |
|---------------------------|-------|------|---------------|----------|-----------|
| 1,1,2,2-Tetrachloroethane | 0.200 | 1.00 | 1.00          | 1        | U         |
| 1,1,2-Trichloroethane     | 0.250 | 1.00 | 1.00          | 1        | U         |
| 1,1-Dichloroethane        | 0.125 | 1.00 | 1.00          | 1        | U         |
| 1,1-Dichloroethene        | 0.500 | 1.00 | 1.00          | 1        | U         |
| 1,2-Dichloroethane        | 0.250 | 1.00 | 1.00          | 1        | U         |
| 1,2-Dichloropropane       | 0.200 | 1.00 | 1.00          | 1        | U         |
| 1,2,4-Trimethylbenzene    | 0.250 | 1.00 | 1.00          | 1        | U         |
| 1,4-Dichlorobenzene       | 0.125 | 1.00 | 1.00          | 1        | U         |
| 1,3,5-Trimethylbenzene    | 0.250 | 1.00 | 1.00          | 1        | U         |
| 1,3-Dichlorobenzene       | 0.250 | 1.00 | 1.00          | 1        | U         |
| 2-Butanone                | 2.50  | 5.00 | 5.00          | 1        | U         |
| 4-Methyl-2-pentanone      | 2.50  | 5.00 | 5.00          | 1        | U         |
| Acetone                   | 2.50  | 5.00 | 5.00          | 1        | U         |
| 2-Hexanone                | 2.50  | 5.00 | 5.00          | 1        | U         |
| Benzene                   | 0.125 | 1.00 | 1.00          | 1        | U         |
| Bromodichloromethane      | 0.250 | 1.00 | 1.00          | 1        | U         |
| Bromomethane              | 0.500 | 1.00 | 1.00          | 1        | U         |
| Carbon disulfide          | 0.500 | 1.00 | 1.00          | 1        | U         |
| Carbon tetrachloride      | 0.250 | 1.00 | 1.00          | 1        | U         |
| Chlorobenzene             | 0.125 | 1.00 | 1.00          | 1        | U         |
| Chloroform                | 0.125 | 1.00 | 1.00          | 1        | U         |
| Dibromochloromethane      | 0.250 | 1.00 | 1.00          | 1        | U         |
| Dichlorodifluoromethane   | 0.250 | 1.00 | 1.00          | 1        | U         |
| Chloromethane             | 0.500 | 1.00 | 1.00          | 1        | U         |
| cis-1,2-Dichloroethene    | 0.250 | 1.00 | 1.00          | 1        | U         |
| Diethyl ether             | 5.00  | 10.0 | 10.0          | 1        | U         |
| Ethylbenzene              | 0.250 | 1.00 | 1.00          | 1        | U         |
| Methylene chloride        | 0.250 | 1.00 | 1.00          | 1        | U         |
| Naphthalene               | 0.200 | 1.00 | 1.00          | 1        | U         |
| Styrene                   | 0.125 | 1.00 | 1.00          | 1        | U         |
| Tetrachloroethene         | 0.250 | 1.00 | 1.00          | 1        | U         |
| Toluene                   | 0.250 | 1.00 | 1.00          | 1        | U         |
| trans-1,2-Dichloroethene  | 0.250 | 1.00 | 1.00          | 1        | U         |
| Trichloroethene           | 0.250 | 1.00 | 1.00          | 1        | U         |
| Trichlorofluoromethane    | 0.250 | 1.00 | 1.00          | 1        | U         |
| Vinyl chloride            | 0.250 | 1.00 | 1.00          | 1        | U         |
| Xylenes                   | 0.500 | 1.00 | 1.00          | 1        | U         |

Report Name:BLANK  
 PDF ID: 5511188  
 09-OCT-2017 12:29



Microbac Laboratories Inc.  
METHOD BLANK REPORT

Login Number:L17091702 Prep Date:10/05/17 11:31 Sample ID:WG632680-01  
Instrument ID:HPMS8 Run Date:10/05/17 11:31 Prep Method:5030B/5030C/503  
File ID:8M421949 Analyst:HRF Method:8260B  
Workgroup (AAB#):WG632680 Matrix:Water Units:ug/L  
Contract #: \_\_\_\_\_ Cal ID: HPMS8 - 13-SEP-17

| Surrogates            | % Recovery | Surrogate Limits |   | Qualifier |      |
|-----------------------|------------|------------------|---|-----------|------|
| 1,2-Dichloroethane-d4 | 95.1       | 70               | - | 120       | PASS |
| 4-Bromofluorobenzene  | 98.9       | 75               | - | 120       | PASS |
| Dibromofluoromethane  | 93.0       | 85               | - | 115       | PASS |
| Toluene-d8            | 94.5       | 85               | - | 120       | PASS |

MDL Method Detection Limit

RL Reporting/Practical Quantitation Limit

ND Analyte Not detected at or above reporting limit

\* |Analyte concentration| > RL

Report Name:BLANK  
PDF ID: 5511188  
09-OCT-2017 12:29



Microbac Laboratories Inc.  
LABORATORY CONTROL SAMPLE (LCS)

Login Number:L17091702 Run Date:10/04/2017 Sample ID:WG632478-02  
 Instrument ID:HPMS8 Run Time:14:25 Prep Method:5030B/5030C/503  
 File ID:8M421920 Analyst:HRF Method:8260B  
 Workgroup (AAB#):WG632478 Matrix:Water Units:ug/L  
 QC Key:DOWWVO2012 Lot#:STD84177 Cal ID: HPMS8 - 13-SEP-17

| Analytes                  | Expected | Found | % Rec | LCS Limits | Q |
|---------------------------|----------|-------|-------|------------|---|
| 1,1,2,2-Tetrachloroethane | 20.0     | 20.3  | 102   | 65 - 130   |   |
| 1,1,2-Trichloroethane     | 20.0     | 20.4  | 102   | 75 - 125   |   |
| 1,1-Dichloroethane        | 20.0     | 19.1  | 95.7  | 70 - 135   |   |
| 1,1-Dichloroethene        | 20.0     | 19.5  | 97.4  | 70 - 130   |   |
| 1,2-Dichloroethane        | 20.0     | 20.2  | 101   | 70 - 130   |   |
| 1,2-Dichloropropane       | 20.0     | 19.7  | 98.7  | 75 - 125   |   |
| 1,2,4-Trimethylbenzene    | 20.0     | 20.8  | 104   | 75 - 130   |   |
| 1,4-Dichlorobenzene       | 20.0     | 19.8  | 99.0  | 75 - 125   |   |
| 1,3,5-Trimethylbenzene    | 20.0     | 20.4  | 102   | 75 - 130   |   |
| 1,3-Dichlorobenzene       | 20.0     | 19.7  | 98.6  | 75 - 125   |   |
| 2-Butanone                | 20.0     | 20.1  | 101   | 30 - 150   |   |
| 4-Methyl-2-pentanone      | 20.0     | 20.0  | 99.8  | 60 - 135   |   |
| Acetone                   | 20.0     | 18.9  | 94.6  | 40 - 140   |   |
| 2-Hexanone                | 20.0     | 19.2  | 95.9  | 55 - 130   |   |
| Benzene                   | 20.0     | 20.3  | 101   | 80 - 120   |   |
| Bromodichloromethane      | 20.0     | 19.6  | 97.9  | 75 - 120   |   |
| Bromomethane              | 20.0     | 15.3  | 76.5  | 30 - 145   |   |
| Carbon disulfide          | 20.0     | 17.8  | 89.2  | 35 - 160   |   |
| Carbon tetrachloride      | 20.0     | 20.1  | 100   | 65 - 140   |   |
| Chlorobenzene             | 20.0     | 19.7  | 98.4  | 80 - 120   |   |
| Chloroform                | 20.0     | 19.3  | 96.4  | 65 - 135   |   |
| Dibromochloromethane      | 20.0     | 20.0  | 100   | 60 - 135   |   |
| Dichlorodifluoromethane   | 20.0     | 22.1  | 111   | 30 - 155   |   |
| Chloromethane             | 20.0     | 20.5  | 103   | 40 - 125   |   |
| cis-1,2-Dichloroethene    | 20.0     | 19.4  | 97.2  | 70 - 125   |   |
| Diethyl ether             | 100      | 95.3  | 95.3  | 70 - 130   |   |
| Ethylbenzene              | 20.0     | 19.6  | 98.0  | 75 - 125   |   |
| Methylene chloride        | 20.0     | 19.9  | 99.5  | 55 - 140   |   |
| Naphthalene               | 20.0     | 21.4  | 107   | 55 - 140   |   |
| Styrene                   | 20.0     | 21.2  | 106   | 65 - 135   |   |
| Tetrachloroethene         | 20.0     | 18.8  | 94.0  | 45 - 150   |   |
| Toluene                   | 20.0     | 19.7  | 98.4  | 75 - 120   |   |
| trans-1,2-Dichloroethene  | 20.0     | 19.8  | 98.9  | 60 - 140   |   |
| Trichloroethene           | 20.0     | 21.3  | 106   | 70 - 125   |   |
| Trichlorofluoromethane    | 20.0     | 20.5  | 102   | 60 - 145   |   |
| Vinyl chloride            | 20.0     | 25.7  | 129   | 50 - 145   |   |
| Xylenes                   | 60.0     | 60.6  | 101   | 70 - 130   |   |

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 PDF File ID: 5511448  
 Report generated: 10/09/2017 12:29



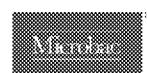
Microbac Laboratories Inc.  
LABORATORY CONTROL SAMPLE (LCS)

Login Number:L17091702 Run Date:10/04/2017 Sample ID:WG632478-02  
Instrument ID:HPMS8 Run Time:14:25 Prep Method:5030B/5030C/503  
File ID:8M421920 Analyst:HRF Method:8260B  
Workgroup (AAB#):WG632478 Matrix:Water Units:ug/L  
QC Key:DOWWVO2012 Lot#:STD84177 Cal ID: HPMS8 - 13-SEP-17

| Surrogates            | % Recovery | Surrogate Limits |   | Qualifier |      |
|-----------------------|------------|------------------|---|-----------|------|
| 1,2-Dichloroethane-d4 | 94.8       | 70               | - | 120       | PASS |
| 4-Bromofluorobenzene  | 99.0       | 75               | - | 120       | PASS |
| Dibromofluoromethane  | 94.1       | 85               | - | 115       | PASS |
| Toluene-d8            | 97.6       | 85               | - | 120       | PASS |

\* EXCEEDS %REC LIMIT

LCS - Modified 03/06/2008  
PDF File ID: 5511448  
Report generated: 10/09/2017 12:29



Microbac Laboratories Inc.  
LABORATORY CONTROL SAMPLE (LCS)

Login Number:L17091702 Run Date:10/05/2017 Sample ID:WG632680-02  
 Instrument ID:HPMS8 Run Time:12:00 Prep Method:5030B/5030C/503  
 File ID:8M421950 Analyst:HRF Method:8260B  
 Workgroup (AAB#):WG632680 Matrix:Water Units:ug/L  
 QC Key:DOWWVO2012 Lot#:STD84177 Cal ID: HPMS8 - 13-SEP-17

| Analytes                  | Expected | Found | % Rec | LCS Limits | Q |
|---------------------------|----------|-------|-------|------------|---|
| 1,1,2,2-Tetrachloroethane | 20.0     | 19.9  | 99.4  | 65 - 130   |   |
| 1,1,2-Trichloroethane     | 20.0     | 19.9  | 99.7  | 75 - 125   |   |
| 1,1-Dichloroethane        | 20.0     | 18.9  | 94.3  | 70 - 135   |   |
| 1,1-Dichloroethene        | 20.0     | 19.4  | 97.1  | 70 - 130   |   |
| 1,2-Dichloroethane        | 20.0     | 19.7  | 98.4  | 70 - 130   |   |
| 1,2-Dichloropropane       | 20.0     | 19.6  | 98.2  | 75 - 125   |   |
| 1,2,4-Trimethylbenzene    | 20.0     | 20.6  | 103   | 75 - 130   |   |
| 1,4-Dichlorobenzene       | 20.0     | 19.6  | 97.8  | 75 - 125   |   |
| 1,3,5-Trimethylbenzene    | 20.0     | 20.0  | 100   | 75 - 130   |   |
| 1,3-Dichlorobenzene       | 20.0     | 19.3  | 96.5  | 75 - 125   |   |
| 2-Butanone                | 20.0     | 19.1  | 95.6  | 30 - 150   |   |
| 4-Methyl-2-pentanone      | 20.0     | 19.5  | 97.3  | 60 - 135   |   |
| Acetone                   | 20.0     | 18.0  | 90.2  | 40 - 140   |   |
| 2-Hexanone                | 20.0     | 18.5  | 92.4  | 55 - 130   |   |
| Benzene                   | 20.0     | 20.1  | 101   | 80 - 120   |   |
| Bromodichloromethane      | 20.0     | 19.2  | 96.2  | 75 - 120   |   |
| Bromomethane              | 20.0     | 14.9  | 74.3  | 30 - 145   |   |
| Carbon disulfide          | 20.0     | 17.2  | 86.2  | 35 - 160   |   |
| Carbon tetrachloride      | 20.0     | 20.0  | 100   | 65 - 140   |   |
| Chlorobenzene             | 20.0     | 19.2  | 96.1  | 80 - 120   |   |
| Chloroform                | 20.0     | 18.8  | 94.0  | 65 - 135   |   |
| Dibromochloromethane      | 20.0     | 19.5  | 97.5  | 60 - 135   |   |
| Dichlorodifluoromethane   | 20.0     | 18.4  | 92.1  | 30 - 155   |   |
| Chloromethane             | 20.0     | 18.9  | 94.6  | 40 - 125   |   |
| cis-1,2-Dichloroethene    | 20.0     | 19.5  | 97.4  | 70 - 125   |   |
| Diethyl ether             | 100      | 93.2  | 93.2  | 70 - 130   |   |
| Ethylbenzene              | 20.0     | 19.5  | 97.4  | 75 - 125   |   |
| Methylene chloride        | 20.0     | 19.5  | 97.4  | 55 - 140   |   |
| Naphthalene               | 20.0     | 19.4  | 96.9  | 55 - 140   |   |
| Styrene                   | 20.0     | 21.1  | 105   | 65 - 135   |   |
| Tetrachloroethene         | 20.0     | 19.0  | 94.9  | 45 - 150   |   |
| Toluene                   | 20.0     | 19.5  | 97.7  | 75 - 120   |   |
| trans-1,2-Dichloroethene  | 20.0     | 19.4  | 97.1  | 60 - 140   |   |
| Trichloroethene           | 20.0     | 20.7  | 104   | 70 - 125   |   |
| Trichlorofluoromethane    | 20.0     | 19.6  | 98.2  | 60 - 145   |   |
| Vinyl chloride            | 20.0     | 24.1  | 121   | 50 - 145   |   |
| Xylenes                   | 60.0     | 59.8  | 99.6  | 70 - 130   |   |

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 PDF File ID: 5511448  
 Report generated: 10/09/2017 12:29



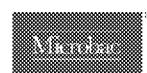
Microbac Laboratories Inc.  
LABORATORY CONTROL SAMPLE (LCS)

Login Number:L17091702 Run Date:10/05/2017 Sample ID:WG632680-02  
Instrument ID:HPMS8 Run Time:12:00 Prep Method:5030B/5030C/503  
File ID:8M421950 Analyst:HRF Method:8260B  
Workgroup (AAB#):WG632680 Matrix:Water Units:ug/L  
QC Key:DOWWVO2012 Lot#:STD84177 Cal ID: HPMS8 - 13-SEP-17

| Surrogates            | % Recovery | Surrogate Limits |   | Qualifier |      |
|-----------------------|------------|------------------|---|-----------|------|
| 1,2-Dichloroethane-d4 | 93.4       | 70               | - | 120       | PASS |
| 4-Bromofluorobenzene  | 98.5       | 75               | - | 120       | PASS |
| Dibromofluoromethane  | 93.7       | 85               | - | 115       | PASS |
| Toluene-d8            | 97.4       | 85               | - | 120       | PASS |

\* EXCEEDS %REC LIMIT

LCS - Modified 03/06/2008  
PDF File ID: 5511448  
Report generated: 10/09/2017 12:29



Loginnum:L17091702

Cal ID: HPMS8- 13-SEP-17

Worknum: WG632680

Instrument ID:HPMS8

Contract #:

Prep Method:5030B/5030C/

Parent ID:L17091702-03

File ID:8M421954

Dil:1

Method:5035A

Sample ID:L17091702-04 MS

File ID:8M421951

Dil:1

8260B

Sample ID:L17091702-05 MSD

File ID:8M421952

Dil:1

Matrix:Water

Units:ug/L

| Analyte                   | Parent | MS Spiked | MS Found | MS %Rec | MSD Spiked | MSD Found | MSD %Rec | %RPD   | %Rec Limits | RPD Limit | Q |
|---------------------------|--------|-----------|----------|---------|------------|-----------|----------|--------|-------------|-----------|---|
| 1,1,2,2-Tetrachloroethane | U      | 20.0      | 20.2     | 101     | 20.0       | 19.1      | 95.3     | 5.80   | 65 - 130    | 20        |   |
| 1,1,2-Trichloroethane     | U      | 20.0      | 19.6     | 97.8    | 20.0       | 19.1      | 95.7     | 2.14   | 75 - 125    | 20        |   |
| 1,1-Dichloroethane        | U      | 20.0      | 18.0     | 90.2    | 20.0       | 18.1      | 90.3     | 0.0792 | 70 - 135    | 20        |   |
| 1,1-Dichloroethene        | U      | 20.0      | 18.1     | 90.5    | 20.0       | 17.7      | 88.7     | 1.98   | 70 - 130    | 20        |   |
| 1,2-Dichloroethane        | U      | 20.0      | 19.4     | 96.8    | 20.0       | 19.1      | 95.4     | 1.43   | 70 - 130    | 20        |   |
| 1,2-Dichloropropane       | U      | 20.0      | 19.1     | 95.6    | 20.0       | 19.2      | 96       | 0.346  | 75 - 125    | 20        |   |
| 1,2,4-Trimethylbenzene    | U      | 20.0      | 20.2     | 101     | 20.0       | 20.3      | 102      | 0.325  | 75 - 130    | 20        |   |
| 1,4-Dichlorobenzene       | U      | 20.0      | 19.3     | 96.3    | 20.0       | 19.2      | 96.1     | 0.233  | 75 - 125    | 20        |   |
| 1,3,5-Trimethylbenzene    | U      | 20.0      | 19.5     | 97.7    | 20.0       | 19.4      | 97       | 0.741  | 75 - 130    | 20        |   |
| 1,3-Dichlorobenzene       | U      | 20.0      | 19.2     | 95.9    | 20.0       | 18.8      | 94.2     | 1.78   | 75 - 125    | 20        |   |
| 2-Butanone                | U      | 20.0      | 20.3     | 102     | 20.0       | 18.6      | 93.1     | 8.80   | 30 - 150    | 20        |   |
| 4-Methyl-2-pentanone      | U      | 20.0      | 19.9     | 99.5    | 20.0       | 17.4      | 87.1     | 13.3   | 60 - 135    | 20        |   |
| Acetone                   | U      | 20.0      | 20.1     | 101     | 20.0       | 19.1      | 95.5     | 5.25   | 40 - 140    | 20        |   |
| 2-Hexanone                | U      | 20.0      | 19.5     | 97.4    | 20.0       | 17.6      | 88       | 10.1   | 55 - 130    | 20        |   |
| Benzene                   | U      | 20.0      | 19.5     | 97.5    | 20.0       | 19.5      | 97.7     | 0.210  | 80 - 120    | 20        |   |
| Bromodichloromethane      | U      | 20.0      | 19.0     | 95.1    | 20.0       | 18.9      | 94.4     | 0.817  | 75 - 120    | 20        |   |
| Bromomethane              | U      | 20.0      | 14.5     | 72.3    | 20.0       | 14.2      | 70.9     | 2.04   | 30 - 145    | 20        |   |
| Carbon disulfide          | U      | 20.0      | 16.9     | 84.3    | 20.0       | 16.0      | 80       | 5.24   | 35 - 160    | 20        |   |
| Carbon tetrachloride      | U      | 20.0      | 19.0     | 94.8    | 20.0       | 18.6      | 93.2     | 1.67   | 65 - 140    | 20        |   |
| Chlorobenzene             | 3.30   | 20.0      | 21.5     | 91.2    | 20.0       | 21.2      | 89.7     | 1.34   | 80 - 120    | 20        |   |
| Chloroform                | U      | 20.0      | 18.4     | 91.9    | 20.0       | 18.4      | 91.8     | 0.141  | 65 - 135    | 20        |   |
| Dibromochloromethane      | U      | 20.0      | 19.4     | 96.8    | 20.0       | 18.7      | 93.3     | 3.62   | 60 - 135    | 20        |   |
| Dichlorodifluoromethane   | U      | 20.0      | 17.8     | 89      | 20.0       | 16.3      | 81.4     | 8.88   | 30 - 155    | 20        |   |
| Chloromethane             | U      | 20.0      | 18.6     | 93.2    | 20.0       | 17.3      | 86.7     | 7.18   | 40 - 125    | 20        |   |
| cis-1,2-Dichloroethene    | U      | 20.0      | 18.6     | 92.8    | 20.0       | 18.7      | 93.4     | 0.647  | 70 - 125    | 20        |   |
| Diethyl ether             | U      | 100       | 95.4     | 95.4    | 100        | 90.3      | 90.3     | 5.44   | 70 - 130    | 20        |   |
| Ethylbenzene              | U      | 20.0      | 18.5     | 92.7    | 20.0       | 18.7      | 93.3     | 0.672  | 75 - 125    | 20        |   |
| Methylene chloride        | U      | 20.0      | 19.0     | 95      | 20.0       | 19.1      | 95.5     | 0.493  | 55 - 140    | 20        |   |
| Naphthalene               | U      | 20.0      | 19.9     | 99.5    | 20.0       | 19.3      | 96.4     | 3.11   | 55 - 140    | 20        |   |
| Styrene                   | U      | 20.0      | 20.2     | 101     | 20.0       | 20.4      | 102      | 0.846  | 65 - 135    | 20        |   |
| Tetrachloroethene         | U      | 20.0      | 17.6     | 88      | 20.0       | 17.6      | 88.1     | 0.0750 | 45 - 150    | 20        |   |
| Toluene                   | U      | 20.0      | 18.9     | 94.3    | 20.0       | 18.7      | 93.5     | 0.863  | 75 - 120    | 20        |   |
| trans-1,2-Dichloroethene  | U      | 20.0      | 18.5     | 92.6    | 20.0       | 18.5      | 92.7     | 0.0890 | 60 - 140    | 20        |   |
| Trichloroethene           | U      | 20.0      | 20.4     | 102     | 20.0       | 20.1      | 101      | 1.43   | 70 - 125    | 20        |   |
| Trichlorofluoromethane    | U      | 20.0      | 18.8     | 94.2    | 20.0       | 17.8      | 89.2     | 5.36   | 60 - 145    | 20        |   |
| Vinyl chloride            | U      | 20.0      | 23.2     | 116     | 20.0       | 22.1      | 110      | 4.67   | 50 - 145    | 20        |   |
| Xylenes                   | U      | 60.0      | 57.7     | 96.1    | 60.0       | 57.3      | 95.5     | 0.660  | 70 - 130    | 20        |   |

\* FAILS %REC LIMIT

# FAILS RPD LIMIT



Microbac Laboratories Inc.  
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L17091702  
Instrument: HPMS8  
Analyst: ADC  
Workgroup: WG628027

Tune ID: WG628027-01  
Run Date: 08/31/2017  
Run Time: 14:11  
File ID: 8M421174  
Cal ID: HPMS8 - 31-AUG-17

| Target Mass | Rel. to Mass | Lower Limit% | Upper Limit% | Rel. Abn% | Raw Abn | Result Pass/Fail |
|-------------|--------------|--------------|--------------|-----------|---------|------------------|
| 50.0        | 95.0         | 15.0         | 40.0         | 28.5      | 8248    | PASS             |
| 75.0        | 95.0         | 30.0         | 60.0         | 48.8      | 14111   | PASS             |
| 95.0        | 95.0         | 100          | 100          | 100       | 28896   | PASS             |
| 96.0        | 95.0         | 5.00         | 9.00         | 5.97      | 1726    | PASS             |
| 173         | 174          | 0            | 2.00         | 0         | 0       | PASS             |
| 174         | 95.0         | 50.0         | 100          | 84.1      | 24314   | PASS             |
| 175         | 174          | 5.00         | 9.00         | 7.59      | 1845    | PASS             |
| 176         | 174          | 95.0         | 101          | 95.2      | 23149   | PASS             |
| 177         | 176          | 5.00         | 9.00         | 6.57      | 1520    | PASS             |

This check relates to the following samples:

| Lab ID      | Client ID | Tag | Date Analyzed    | Q |
|-------------|-----------|-----|------------------|---|
| WG628027-02 | STD       | 01  | 08/31/2017 15:06 |   |
| WG628027-03 | STD       | 01  | 08/31/2017 15:36 |   |
| WG628027-04 | STD       | 01  | 08/31/2017 16:05 |   |
| WG628027-05 | STD-CCV   | 01  | 08/31/2017 16:35 |   |
| WG628027-06 | STD       | 01  | 08/31/2017 17:04 |   |
| WG628027-07 | STD       | 01  | 08/31/2017 17:34 |   |
| WG628027-08 | STD       | 01  | 08/31/2017 18:04 |   |
| WG628027-09 | STD       | 01  | 08/31/2017 18:33 |   |
| WG628027-10 | SSCV      | 01  | 08/31/2017 19:33 |   |

\* Sample past 12 hour tune limit

TUNE - Modified 03/06/2008  
PDF File ID: 5511209  
Report generated 10/09/2017 12:29



Microbac Laboratories Inc.  
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L17091702  
Instrument: HPMS8  
Analyst: TMB  
Workgroup: WG629567

Tune ID: WG629567-01  
Run Date: 09/13/2017  
Run Time: 14:18  
File ID: 8M421377  
Cal ID: HPMS8 - 13-SEP-17

| Target Mass | Rel. to Mass | Lower Limit% | Upper Limit% | Rel. Abn% | Raw Abn | Result Pass/Fail |
|-------------|--------------|--------------|--------------|-----------|---------|------------------|
| 50.0        | 95.0         | 15.0         | 40.0         | 28.0      | 11358   | PASS             |
| 75.0        | 95.0         | 30.0         | 60.0         | 47.1      | 19109   | PASS             |
| 95.0        | 95.0         | 100          | 100          | 100       | 40581   | PASS             |
| 96.0        | 95.0         | 5.00         | 9.00         | 6.53      | 2650    | PASS             |
| 173         | 174          | 0            | 2.00         | 0         | 0       | PASS             |
| 174         | 95.0         | 50.0         | 100          | 82.9      | 33634   | PASS             |
| 175         | 174          | 5.00         | 9.00         | 7.97      | 2681    | PASS             |
| 176         | 174          | 95.0         | 101          | 99.2      | 33368   | PASS             |
| 177         | 176          | 5.00         | 9.00         | 7.07      | 2359    | PASS             |

This check relates to the following samples:

| Lab ID      | Client ID | Tag | Date Analyzed    | Q |
|-------------|-----------|-----|------------------|---|
| WG629567-02 | STD       | 01  | 09/13/2017 15:15 |   |
| WG629567-03 | STD       | 01  | 09/13/2017 15:44 |   |
| WG629567-04 | STD       | 01  | 09/13/2017 16:17 |   |
| WG629567-05 | STD       | 01  | 09/13/2017 16:49 |   |
| WG629567-06 | STD       | 01  | 09/13/2017 17:17 |   |
| WG629567-07 | STD       | 01  | 09/13/2017 17:46 |   |
| WG629567-08 | STD-CCV   | 01  | 09/13/2017 18:15 |   |
| WG629567-09 | STD       | 01  | 09/13/2017 18:44 |   |
| WG629567-10 | STD       | 01  | 09/13/2017 19:13 |   |
| WG629567-11 | STD       | 01  | 09/13/2017 19:41 |   |
| WG629567-12 | SSCV      | 01  | 09/13/2017 21:09 |   |

\* Sample past 12 hour tune limit

TUNE - Modified 03/06/2008  
PDF File ID: 5511209  
Report generated 10/09/2017 12:29



Microbac Laboratories Inc.  
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L17091702  
Instrument: HPMS8  
Analyst: HRF  
Workgroup: WG632477

Tune ID: WG632477-01  
Run Date: 10/04/2017  
Run Time: 11:29  
File ID: 8M421914  
Cal ID: HPMS8 - 13-SEP-17

| Target Mass | Rel. to Mass | Lower Limit% | Upper Limit% | Rel. Abn% | Raw Abn | Result Pass/Fail |
|-------------|--------------|--------------|--------------|-----------|---------|------------------|
| 50.0        | 95.0         | 15.0         | 40.0         | 30.2      | 11725   | PASS             |
| 75.0        | 95.0         | 30.0         | 60.0         | 49.3      | 19122   | PASS             |
| 95.0        | 95.0         | 100          | 100          | 100       | 38824   | PASS             |
| 96.0        | 95.0         | 5.00         | 9.00         | 7.22      | 2802    | PASS             |
| 173         | 174          | 0            | 2.00         | 0.284     | 93      | PASS             |
| 174         | 95.0         | 50.0         | 100          | 84.3      | 32720   | PASS             |
| 175         | 174          | 5.00         | 9.00         | 7.74      | 2534    | PASS             |
| 176         | 174          | 95.0         | 101          | 99.6      | 32605   | PASS             |
| 177         | 176          | 5.00         | 9.00         | 6.57      | 2141    | PASS             |

This check relates to the following samples:

| Lab ID       | Client ID   | Tag | Date Analyzed    | Q |
|--------------|-------------|-----|------------------|---|
| WG632477-02  | CCV         | 01  | 10/04/2017 11:55 |   |
| WG632478-01  | BLANK       | 01  | 10/04/2017 13:26 |   |
| L17091702-11 | TB01-092717 | 01  | 10/04/2017 13:56 |   |
| WG632478-02  | LCS         | 01  | 10/04/2017 14:25 |   |
| WG632478-06  | BLANK2      | 01  | 10/05/2017 00:39 | * |

\* Sample past 12 hour tune limit

TUNE - Modified 03/06/2008  
PDF File ID: 5511209  
Report generated 10/09/2017 12:29



Microbac Laboratories Inc.  
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L17091702  
Instrument: HPMS8  
Analyst: HRF  
Workgroup: WG632679

Tune ID: WG632679-01  
Run Date: 10/05/2017  
Run Time: 09:35  
File ID: 8M421945  
Cal ID: HPMS8 - 13-SEP-17

| Target Mass | Rel. to Mass | Lower Limit% | Upper Limit% | Rel. Abn% | Raw Abn | Result Pass/Fail |
|-------------|--------------|--------------|--------------|-----------|---------|------------------|
| 50.0        | 95.0         | 15.0         | 40.0         | 29.3      | 9562    | PASS             |
| 75.0        | 95.0         | 30.0         | 60.0         | 47.9      | 15641   | PASS             |
| 95.0        | 95.0         | 100          | 100          | 100       | 32634   | PASS             |
| 96.0        | 95.0         | 5.00         | 9.00         | 6.01      | 1962    | PASS             |
| 173         | 174          | 0            | 2.00         | 0.714     | 205     | PASS             |
| 174         | 95.0         | 50.0         | 100          | 87.9      | 28701   | PASS             |
| 175         | 174          | 5.00         | 9.00         | 6.95      | 1995    | PASS             |
| 176         | 174          | 95.0         | 101          | 99.0      | 28421   | PASS             |
| 177         | 176          | 5.00         | 9.00         | 7.01      | 1993    | PASS             |

This check relates to the following samples:

| Lab ID       | Client ID        | Tag | Date Analyzed    | Q |
|--------------|------------------|-----|------------------|---|
| WG632679-02  | CCV              | 01  | 10/05/2017 10:00 |   |
| WG632680-01  | BLANK            | 01  | 10/05/2017 11:31 |   |
| WG632680-02  | LCS              | 01  | 10/05/2017 12:00 |   |
| L17091702-04 | 0297-PW-092617MS | 01  | 10/05/2017 12:31 |   |
| L17091702-05 | 0297-PW-092617SD | 01  | 10/05/2017 13:02 |   |
| L17091702-03 | 0297-PW-092617   | 01  | 10/05/2017 14:02 |   |
| L17091702-01 | 0293-PW-092617   | 01  | 10/05/2017 15:02 |   |
| L17091702-02 | 0293-PW-092617D  | 01  | 10/05/2017 15:33 |   |
| L17091702-06 | 0019-PW-092717   | 01  | 10/05/2017 16:02 |   |
| L17091702-07 | 0298-PW-092717   | 01  | 10/05/2017 16:32 |   |
| L17091702-08 | 0300-PW-092717   | 01  | 10/05/2017 17:01 |   |
| L17091702-09 | 0301-PW-092717   | 01  | 10/05/2017 17:31 |   |
| L17091702-10 | 0305-PW-092717   | 01  | 10/05/2017 18:00 |   |

\* Sample past 12 hour tune limit

TUNE - Modified 03/06/2008  
PDF File ID: 5511209  
Report generated 10/09/2017 12:29



## Calibration Table Report

Method: A9FOOWTR.M

Title: A9-FOO Water SOP:MSV01 08-31-17 HPM8B

Last Calibration: Tue Sep 05 14:28:41 2017

Curve: WG628027

Calibration Files

|            |            |            |            |            |            |            |            |
|------------|------------|------------|------------|------------|------------|------------|------------|
| 5          | 20         | 50         | 100        | 200        | 300        | 400        | 500        |
| 8M421176.D | 8M421177.D | 8M421178.D | 8M421179.D | 8M421180.D | 8M421181.D | 8M421182.D | 8M421183.D |

| Compound               |      |       |       |       |       |       |       |       |       | Avg   | %RSD  |
|------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Fluorobenzene          | ISTD |       |       |       |       |       |       |       |       |       |       |
| Acetonitrile           |      | 0.029 | 0.031 | 0.029 | 0.028 | 0.030 | 0.030 | 0.031 | 0.030 | 3.362 |       |
| 3-Chloro-1-propene     |      | 0.776 | 0.836 | 0.870 | 0.863 | 0.874 | 0.840 | 0.807 | 0.773 | 0.830 | 4.885 |
| 2-Chloro-1,3-butadiene |      | 0.670 | 0.740 | 0.785 | 0.794 | 0.804 | 0.769 | 0.737 | 0.700 | 0.750 | 6.291 |
| Ethyl Acetate          |      |       | 0.260 | 0.283 | 0.285 | 0.280 | 0.285 | 0.281 | 0.280 | 0.279 | 3.184 |
| Methacrylonitrile      |      | 0.069 | 0.078 | 0.083 | 0.085 | 0.083 | 0.085 | 0.085 | 0.086 | 0.082 | 6.972 |
| Isobutyl Alcohol       |      |       |       | 0.009 | 0.009 | 0.009 | 0.010 | 0.010 | 0.011 | 0.010 | 8.810 |
| 1-Butanol              |      |       |       |       |       |       |       |       |       | 0.000 | 0.000 |
| Methyl methacrylate    |      | 0.282 | 0.290 | 0.314 | 0.318 | 0.318 | 0.319 | 0.311 | 0.310 | 0.308 | 4.536 |
| 2-Nitropropane         |      |       |       | 0.092 | 0.099 | 0.101 | 0.101 | 0.103 | 0.101 | 0.103 | 0.100 |
| Chlorobenzene-d5       | ISTD |       |       |       |       |       |       |       |       |       |       |
| 1,4-Dichlorobenzene-d4 | ISTD |       |       |       |       |       |       |       |       |       |       |
| Cyclohexanone          |      |       | 0.012 | 0.013 | 0.012 | 0.013 | 0.014 | 0.015 | 0.013 | 9.192 |       |

Tue Sep 05 14:30:32 2017

## Calibration Table Report

Method: 8260WT.M

Title: Method 8260B/624 WTR-SOP:OVLMSV01 09-13-17 HPMS8

Last Calibration: Thu Sep 14 08:56:14 2017

Curve: WG629567

Calibration Files

|   |                                       | 0.3        | 0.4        | 1          | 2          | 5          | 20         | 50         | 100        | 200        | 300        |        | r^2     |         |         |  |
|---|---------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|--------|---------|---------|---------|--|
|   |                                       | 8M421379.D | 8M421380.D | 8M421381.D | 8M421382.D | 8M421383.D | 8M421384.D | 8M421385.D | 8M421386.D | 8M421387.D | 8M421388.D | Avg    | %RSD    | Linear  | Quad    |  |
| C | Fluorobenzene                         |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Dichlorodifluoromethane               |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| P | Chloromethane                         |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| C | Vinyl Chloride                        | 0.363      | 0.340      | 0.345      | 0.340      | 0.345      | 0.336      | 0.314      | 0.327      |            |            | 0.339  | 4.229   |         |         |  |
| T | 1,3-Butadiene                         |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Bromomethane                          |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Chloroethane                          | 0.237      | 0.223      | 0.241      | 0.250      | 0.250      | 0.258      | 0.241      | 0.252      |            |            | 0.244  | 4.484   |         |         |  |
| T | Trichlorofluoromethane                | 0.517      | 0.457      | 0.493      | 0.538      | 0.516      | 0.528      | 0.488      | 0.520      |            |            | 0.507  | 5.191   |         |         |  |
| T | Diethyl ether                         |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Isoprene                              |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Acrolein                              |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | 1,1,2-Trichloro-1,2,2-Trifluoroethane | 0.225      | 0.254      | 0.273      | 0.265      | 0.268      | 0.249      | 0.262      |            |            |            | 0.257  | 6.203   |         |         |  |
| T | Acetone                               |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| C | 1,1-Dichloroethene                    | 0.579      | 0.527      | 0.533      | 0.562      | 0.565      | 0.571      | 0.529      | 0.546      |            |            | 0.551  | 3.702   |         |         |  |
| T | Tert-Butyl Alcohol                    |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Dimethyl Sulfide                      |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Iodomethane                           |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Methyl acetate                        |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Methylene Chloride                    |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Carbon Disulfide                      |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Acrylonitrile                         |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Methyl Tert Butyl Ether               |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | trans-1,2-Dichloroethene              | 0.543      | 0.495      | 0.501      | 0.538      | 0.537      | 0.538      | 0.507      | 0.513      |            |            | 0.521  | 3.715   |         |         |  |
| T | n-Hexane                              |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Diisopropyl ether                     |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Vinyl Acetate                         |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| P | 1,1-Dichloroethane                    | 0.613      | 0.610      | 0.630      | 0.653      | 0.643      | 0.642      | 0.601      | 0.602      |            |            | 0.624  | 3.263   |         |         |  |
| T | Ethyl-Tert-Butyl ether                |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | 2-Butanone                            |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Propionitrile                         |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | 2,2-Dichloropropane                   |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | cis-1,2-Dichloroethene                |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| C | Chloroform                            | 0.568      | 0.572      | 0.499      | 0.526      | 0.525      | 0.505      | 0.513      | 0.477      | 0.474      |            | 0.518  | 6.741   |         |         |  |
| T | 1-Bromopropane                        |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Bromochloromethane                    |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Tetrahydrofuran                       |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| S | Dibromofluoromethane                  |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | 1,1,1-Trichloroethane                 |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Cyclohexane                           |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | 1,1-Dichloropropene                   |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Tert-Amyl-Methyl ether                |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Carbon Tetrachloride                  |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| S | 1,2-Dichloroethane-d4                 |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| T | Heptane                               |            |            |            |            |            |            |            |            |            |            | 0      | 0       |         |         |  |
| T | 1,2-Dichloroethane                    | 0.465      | 0.412      | 0.453      | 0.476      | 0.459      | 0.465      | 0.441      | 0.441      |            |            | 0.4514 | 4.46079 |         |         |  |
| T | Benzene                               | 1.136      | 1.054      | 1.105      | 1.121      | 1.103      | 1.1        | 1.014      | 0.969      |            |            | 1.0753 | 5.39779 |         |         |  |
| T | Trichloroethene                       | 0.279      | 0.262      | 0.302      | 0.301      | 0.312      | 0.32       | 0.303      | 0.31       |            |            | 0.2987 | 6.35845 |         |         |  |
| T | Methylcyclohexane                     |            |            |            |            |            |            |            |            |            |            |        |         |         |         |  |
| C | 1,2-Dichloropropane                   | 0.315      | 0.322      | 0.355      | 0.365      | 0.362      | 0.366      | 0.347      | 0.356      |            |            | 0.3484 | 5.65905 |         |         |  |
| T | Bromodichloromethane                  | 0.352      | 0.371      | 0.359      | 0.377      | 0.386      | 0.398      | 0.38       | 0.382      |            |            | 0.3755 | 3.88984 |         |         |  |
| T | 1,4-Dioxane                           |            |            |            |            | 0.001      | 0.001      | 0.001      | 0.002      | 0.002      |            | 0.002  | 0.0015  | 13.7848 |         |  |
| T | Dibromomethane                        | 0.165      | 0.149      | 0.146      | 0.156      | 0.158      | 0.164      | 0.156      | 0.158      |            |            | 0.1565 | 4.1959  |         |         |  |
| T | 2-Chloroethyl Vinyl Ether             |            |            |            |            | 0.126      | 0.142      | 0.154      | 0.173      | 0.174      | 0.177      | 0.181  | 0.174   | 0.1628  | 12.2292 |  |
| T | 4-Methyl-2-Pentanone                  |            |            |            |            |            |            | 0.08       | 0.093      | 0.094      | 0.1        | 0.103  | 0.1     | 0.0951  | 8.75964 |  |
| T | cis-1,3-Dichloropropene               | 0.403      | 0.384      | 0.428      | 0.442      | 0.446      | 0.463      | 0.44       | 0.444      |            |            | 0.4314 | 5.97072 |         |         |  |

|   |                             |      |       |       |       |       |       |       |       |        |         |
|---|-----------------------------|------|-------|-------|-------|-------|-------|-------|-------|--------|---------|
| T | Dimethyl Disulfide          |      |       | 0.212 | 0.235 | 0.254 | 0.252 | 0.26  | 0.246 | 0.2429 | 7.21488 |
| I | Chlorobenzene-d5            | ISTD |       |       |       |       |       |       |       |        |         |
| S | Toluene-d8                  |      |       | 1.315 | 1.259 | 1.242 | 1.208 | 1.176 | 1.139 | 1.103  | 1.2059  |
| C | Toluene                     |      | 1.506 | 1.416 | 1.422 | 1.502 | 1.462 | 1.466 | 1.313 | 1.23   | 1.4146  |
| T | Ethyl Methacrylate          |      |       | 0.227 | 0.262 | 0.29  | 0.307 | 0.322 | 0.323 | 0.327  | 0.321   |
| T | Paraldehyde                 |      |       |       |       |       |       |       |       |        | 0.2975  |
| T | trans-1,3-Dichloropropene   |      |       | 0.43  | 0.427 | 0.466 | 0.466 | 0.479 | 0.46  | 0.464  | 0.4559  |
| T | 1,1,2-Trichloroethane       |      | 0.241 | 0.236 | 0.231 | 0.247 | 0.25  | 0.254 | 0.242 | 0.246  | 0.2433  |
| T | 2-Hexanone                  |      |       |       |       | 0.091 | 0.099 | 0.104 | 0.11  | 0.113  | 0.114   |
| T | 1,3-Dichloropropane         |      | 0.418 | 0.424 | 0.439 | 0.445 | 0.44  | 0.443 | 0.42  | 0.424  | 0.4317  |
| T | Tetrachloroethene           |      |       | 0.296 | 0.292 | 0.31  | 0.329 | 0.319 | 0.326 | 0.304  | 0.316   |
| T | Dibromochloromethane        |      | 0.331 | 0.303 | 0.304 | 0.344 | 0.348 | 0.36  | 0.35  | 0.361  | 0.3376  |
| T | 1,2-Dibromoethane           |      |       | 0.215 | 0.224 | 0.23  | 0.251 | 0.254 | 0.258 | 0.249  | 0.257   |
| T | 1-Chlorohexane              |      |       | 0.408 | 0.441 | 0.44  | 0.48  | 0.483 | 0.502 | 0.465  | 0.479   |
| P | Chlorobenzene               |      |       | 1.067 | 0.998 | 0.994 | 1.045 | 1.022 | 1.026 | 0.942  | 0.899   |
| T | 1,1,1,2-Tetrachloroethane   |      |       | 0.309 | 0.313 | 0.356 | 0.381 | 0.383 | 0.387 | 0.366  | 0.362   |
| C | Ethylbenzene                |      |       | 0.53  | 0.515 | 0.505 | 0.54  | 0.537 | 0.544 | 0.497  | 0.496   |
| T | m,p-Xylene                  |      |       | 0.659 | 0.612 | 0.62  | 0.666 | 0.654 | 0.655 | 0.592  | 0.545   |
| T | o-Xylene                    |      |       |       |       | 0.58  | 0.582 | 0.63  | 0.632 | 0.652  | 0.602   |
| T | Styrene                     |      |       | 0.898 | 0.942 | 0.928 | 1.049 | 1.078 | 1.092 | 1.002  | 0.951   |
| P | Bromoform                   |      |       |       |       | 0.163 | 0.182 | 0.207 | 0.217 | 0.23   | 0.227   |
| T | Isopropylbenzene            |      |       | 1.642 | 1.479 | 1.52  | 1.689 | 1.633 | 1.652 | 1.473  | 1.365   |
| I | 1,4-Dichlorobenzene-d4      | ISTD |       |       |       |       |       |       |       |        |         |
| P | 1,1,2,2-Tetrachloroethane   |      |       | 0.451 | 0.445 | 0.473 | 0.498 | 0.499 | 0.501 | 0.493  | 0.502   |
| S | p-Bromofluorobenzene        |      |       |       |       | 0.895 | 0.909 | 0.935 | 0.903 | 0.905  | 0.892   |
| T | 1,2,3-Trichloropropane      |      |       |       |       | 0.112 | 0.147 | 0.153 | 0.15  | 0.149  | 0.148   |
| T | trans-1,4-Dichloro-2-Butene |      |       |       |       | 0.191 | 0.24  | 0.261 | 0.262 | 0.271  | 0.28    |
| T | n-Propylbenzene             |      |       |       |       | 3.708 | 3.33  | 3.494 | 3.824 | 3.738  | 3.615   |
| T | Bromobenzene                |      | 0.766 | 0.779 | 0.729 | 0.786 | 0.8   | 0.798 | 0.795 | 0.759  | 0.766   |
| T | 1,3,5-Trimethylbenzene      |      |       |       |       | 2.484 | 2.27  | 2.367 | 2.576 | 2.587  | 2.529   |
| T | 2-Chlorotoluene             |      |       |       |       | 2.23  | 2.293 | 2.42  | 2.66  | 2.545  | 2.508   |
| T | 4-Chlorotoluene             |      |       |       |       | 2.217 | 2.006 | 2.056 | 2.115 | 2.088  | 1.993   |
| T | a-Methylstyrene             |      |       |       |       |       |       | 1.351 | 1.435 | 1.471  | 1.389   |
| T | tert-Butylbenzene           |      |       |       |       |       |       | 1.351 | 1.435 | 1.471  | 1.389   |
| T | 1,2,4-Trimethylbenzene      |      |       |       |       |       |       | 1.351 | 1.435 | 1.471  | 1.389   |
| T | sec-Butylbenzene            |      |       |       |       |       |       | 1.351 | 1.435 | 1.471  | 1.389   |
| T | p-Isopropyltoluene          |      |       |       |       |       |       | 1.351 | 1.435 | 1.471  | 1.389   |
| T | 1,3-Dichlorobenzene         |      |       |       |       |       |       | 1.351 | 1.435 | 1.471  | 1.389   |
| T | 1,4-Dichlorobenzene         |      | 1.683 | 1.627 | 1.507 | 1.533 | 1.626 | 1.584 | 1.56  | 1.462  | 1.416   |
| T | n-Butylbenzene              |      |       |       |       |       |       | 1.351 | 1.435 | 1.471  | 1.389   |
| T | 1,2-Dichlorobenzene         |      | 1.543 | 1.467 | 1.369 | 1.399 | 1.451 | 1.446 | 1.437 | 1.346  | 1.326   |
| T | 1,2-Dibromo-3-Chloropropane |      |       |       |       |       |       | 1.351 | 1.435 | 1.471  | 1.389   |
| T | 1,2,4-Trichlorobenzene      |      |       |       |       |       |       | 1.351 | 1.435 | 1.471  | 1.389   |
| T | Hexachlorobutadiene         |      |       |       |       |       |       | 1.351 | 1.435 | 1.471  | 1.389   |
| T | Naphthalene                 |      |       |       |       |       |       | 1.351 | 1.435 | 1.471  | 1.389   |
| T | 1,2,3-Trichlorobenzene      |      |       |       |       |       |       | 1.351 | 1.435 | 1.471  | 1.389   |

Thu Sep 14 09:01:55 2017

Microbac Laboratories Inc.  
ALTERNATE SOURCE CALIBRATION REPORT

|                                 |                                  |                               |
|---------------------------------|----------------------------------|-------------------------------|
| Login Number: <u>L17091702</u>  | Run Date: <u>09/13/2017</u>      | Sample ID: <u>WG629567-12</u> |
| Instrument ID: <u>HPMS8</u>     | Run Time: <u>21:09</u>           | Method: <u>8260B</u>          |
| File ID: <u>8M421391</u>        | Analyst: <u>TMB</u>              | QC Key: <u>DOWWVO2012</u>     |
| ICAL Workgroup: <u>WG629567</u> | Cal ID: <u>HPMS8 - 13-SEP-17</u> |                               |

| Analyte                   | Expected | Found | Units | RF     | %D    | UCL | Q |
|---------------------------|----------|-------|-------|--------|-------|-----|---|
| 1,1-Dichloroethene        | CCC      | 50.0  | ug/L  | 0.531  | 3.70  | 25  |   |
| 1,2-Dichloropropane       | CCC      | 50.0  | ug/L  | 0.357  | 2.40  | 25  |   |
| Chloroform                | CCC      | 50.0  | ug/L  | 0.492  | 5.00  | 25  |   |
| Ethylbenzene              | CCC      | 50.0  | ug/L  | 0.529  | 1.60  | 25  |   |
| Toluene                   | CCC      | 50.0  | ug/L  | 1.40   | 1.10  | 25  |   |
| Vinyl Chloride            | CCC      | 50.0  | ug/L  | 0.312  | 7.80  | 25  |   |
| Bromoform                 | SPCC     | 50.0  | ug/L  | 0.217  | 3.60  | 25  |   |
| 1,1,2,2-Tetrachloroethane | SPCC     | 50.0  | ug/L  | 0.494  | 2.40  | 25  |   |
| 1,1-Dichloroethane        | SPCC     | 50.0  | ug/L  | 0.600  | 3.80  | 25  |   |
| Chlorobenzene             | SPCC     | 50.0  | ug/L  | 1.01   | 1.30  | 25  |   |
| Chloromethane             | SPCC     | 50.0  | ug/L  | 0.601  | 14.6  | 25  |   |
| o-Xylene                  |          | 50.0  | ug/L  | 0.656  | 7.30  | 25  |   |
| m-,p-Xylene               |          | 100   | ug/L  | 0.643  | 2.80  | 25  |   |
| 1,1,2-Trichloroethane     |          | 50.0  | ug/L  | 0.247  | 1.70  | 25  |   |
| 1,2-Dichloroethane        |          | 50.0  | ug/L  | 0.452  | 0.200 | 25  |   |
| 1,2,4-Trimethylbenzene    |          | 50.0  | ug/L  | 2.61   | 4.50  | 25  |   |
| 1,4-Dichlorobenzene       |          | 50.0  | ug/L  | 1.59   | 1.90  | 25  |   |
| 1,3,5-Trimethylbenzene    |          | 50.0  | ug/L  | 2.48   | 2.80  | 25  |   |
| 1,3-Dichlorobenzene       |          | 50.0  | ug/L  | 1.55   | 0.200 | 25  |   |
| 2-Butanone                |          | 50.0  | ug/L  | 0.147  | 3.30  | 25  |   |
| 4-Methyl-2-Pentanone      |          | 50.0  | ug/L  | 0.101  | 5.90  | 25  |   |
| Acetone                   |          | 50.0  | ug/L  | 0.0888 | 1.40  | 25  |   |
| 2-Hexanone                |          | 50.0  | ug/L  | 0.113  | 7.50  | 25  |   |
| Benzene                   |          | 50.0  | ug/L  | 1.07   | 0.100 | 25  |   |
| Bromodichloromethane      |          | 50.0  | ug/L  | 0.372  | 1.00  | 25  |   |
| Bromomethane              |          | 50.0  | ug/L  | 0.205  | 13.9  | 25  |   |
| Carbon Disulfide          |          | 50.0  | ug/L  | 0.810  | 5.40  | 25  |   |
| Carbon Tetrachloride      |          | 50.0  | ug/L  | 0.432  | 3.00  | 25  |   |
| Dibromochloromethane      |          | 50.0  | ug/L  | 0.340  | 0.600 | 25  |   |
| Dichlorodifluoromethane   |          | 50.0  | ug/L  | 0.374  | 12.5  | 25  |   |
| cis-1,2-Dichloroethene    |          | 50.0  | ug/L  | 0.302  | 1.80  | 25  |   |
| Diethyl ether             |          | 100   | ug/L  | 0.234  | 15.3  | 25  |   |
| Methylene Chloride        |          | 50.0  | ug/L  | 0.268  | 2.20  | 25  |   |
| Naphthalene               |          | 50.0  | ug/L  | 1.69   | 7.10  | 25  |   |
| Styrene                   |          | 50.0  | ug/L  | 1.08   | 8.70  | 25  |   |
| Tetrachloroethene         |          | 50.0  | ug/L  | 0.312  | 0     | 25  |   |
| trans-1,2-Dichloroethene  |          | 50.0  | ug/L  | 0.524  | 0.500 | 25  |   |
| Trichloroethene           |          | 50.0  | ug/L  | 0.308  | 3.00  | 25  |   |
| Trichlorofluoromethane    |          | 50.0  | ug/L  | 0.482  | 4.90  | 25  |   |
| Xylenes                   |          | 150   | ug/L  | 0.649  | 4.30  | 25  |   |

\* Exceeds %D Limit

ALT - Modified 09/06/2007  
 Version 1.5 PDF File ID: 5511200  
 Report generated 10/09/2017 12:29



Microbac Laboratories Inc.  
ALTERNATE SOURCE CALIBRATION REPORT

Login Number:L17091702 Run Date:09/13/2017 Sample ID:WG629567-12  
Instrument ID:HPMS8 Run Time:21:09 Method:8260B  
File ID:8M421391 Analyst:TMB QC Key:DOWWVO2012  
ICal Workgroup:WG629567 Cal ID: HPMS8 - 13-SEP-17

| Analyte                                 | Expected | Found | Units | RF | %D | UCL | Q |
|---|----------|-------|-------|----|----|-----|---|
| CCC Calibration Check Compounds         |          |       |       |    |    |     |   |
| SPCC System Performance Check Compounds |          |       |       |    |    |     |   |

ALT - Modified 09/06/2007  
Version 1.5 PDF File ID: 5511200  
Report generated 10/09/2017 12:29



Login Number:L17091702 Run Date:10/04/2017 Sample ID:WG632477-02  
 Instrument ID:HPMS8 Run Time:11:55 Method:8260B  
 File ID:8M421915 Analyst:HRF QC Key:DOWWVO2012  
 Workgroup (AAB#):WG632478 Cal ID: HPMS8 - 13-SEP-17  
 Matrix:WATER

| Analyte                   | Expected | Found | UNITS | RF     | %D     | UCL | Q |
|---------------------------|----------|-------|-------|--------|--------|-----|---|
| 1,1-Dichloroethene        | CCC      | 50.0  | ug/L  | 0.543  | 1.53   | 25  |   |
| 1,2-Dichloropropane       | CCC      | 50.0  | ug/L  | 0.351  | 0.644  | 25  |   |
| Chloroform                | CCC      | 50.0  | ug/L  | 0.501  | 3.26   | 25  |   |
| Ethylbenzene              | CCC      | 50.0  | ug/L  | 0.517  | 0.702  | 25  |   |
| Toluene                   | CCC      | 50.0  | ug/L  | 1.41   | 0.0580 | 25  |   |
| Vinyl Chloride            | CCC      | 50.0  | ug/L  | 0.347  | 2.44   | 25  |   |
| Bromoform                 | SPCC     | 50.0  | ug/L  | 0.217  | 3.98   | 25  |   |
| 1,1,2,2-Tetrachloroethane | SPCC     | 50.0  | ug/L  | 0.503  | 4.20   | 25  |   |
| 1,1-Dichloroethane        | SPCC     | 50.0  | ug/L  | 0.614  | 1.60   | 25  |   |
| Chlorobenzene             | SPCC     | 50.0  | ug/L  | 0.973  | 2.67   | 25  |   |
| Chloromethane             | SPCC     | 50.0  | ug/L  | 0.612  | 13.0   | 25  |   |
| m-,p-Xylene               |          | 100   | ug/L  | 0.631  | 0.926  | 25  |   |
| o-Xylene                  |          | 50.0  | ug/L  | 0.621  | 1.71   | 25  |   |
| 1,1,2-Trichloroethane     |          | 50.0  | ug/L  | 0.245  | 0.764  | 25  |   |
| 1,2-Dichloroethane        |          | 50.0  | ug/L  | 0.446  | 1.30   | 25  |   |
| 1,2,4-Trimethylbenzene    |          | 50.0  | ug/L  | 2.58   | 3.54   | 25  |   |
| 1,4-Dichlorobenzene       |          | 50.0  | ug/L  | 1.53   | 1.84   | 25  |   |
| 1,3,5-Trimethylbenzene    |          | 50.0  | ug/L  | 2.52   | 4.17   | 25  |   |
| 1,3-Dichlorobenzene       |          | 50.0  | ug/L  | 1.56   | 0.697  | 25  |   |
| 2-Butanone                |          | 50.0  | ug/L  | 0.139  | 2.29   | 25  |   |
| 4-Methyl-2-Pentanone      |          | 50.0  | ug/L  | 0.0936 | 1.49   | 25  |   |
| Acetone                   |          | 50.0  | ug/L  | 0.0810 | 10.1   | 25  |   |
| 2-Hexanone                |          | 50.0  | ug/L  | 0.100  | 4.74   | 25  |   |
| Benzene                   |          | 50.0  | ug/L  | 1.08   | 0.740  | 25  |   |
| Bromodichloromethane      |          | 50.0  | ug/L  | 0.391  | 4.22   | 25  |   |
| Bromomethane              |          | 50.0  | ug/L  | 0.192  | 19.7   | 25  |   |
| Carbon Disulfide          |          | 50.0  | ug/L  | 0.880  | 2.75   | 25  |   |
| Carbon Tetrachloride      |          | 50.0  | ug/L  | 0.457  | 2.49   | 25  |   |
| Dibromochloromethane      |          | 50.0  | ug/L  | 0.357  | 5.85   | 25  |   |
| Dichlorodifluoromethane   |          | 50.0  | ug/L  | 0.423  | 0.956  | 25  |   |
| cis-1,2-Dichloroethene    |          | 50.0  | ug/L  | 0.306  | 0.346  | 25  |   |
| Diethyl ether             |          | 100   | ug/L  | 0.233  | 15.7   | 25  |   |
| Methylene Chloride        |          | 50.0  | ug/L  | 0.273  | 0.315  | 25  |   |
| Naphthalene               |          | 50.0  | ug/L  | 1.65   | 4.35   | 25  |   |
| Styrene                   |          | 50.0  | ug/L  | 1.08   | 8.57   | 25  |   |
| Tetrachloroethene         |          | 50.0  | ug/L  | 0.301  | 3.54   | 25  |   |
| trans-1,2-Dichloroethene  |          | 50.0  | ug/L  | 0.520  | 0.251  | 25  |   |
| Trichloroethene           |          | 50.0  | ug/L  | 0.317  | 6.07   | 25  |   |
| Trichlorofluoromethane    |          | 50.0  | ug/L  | 0.508  | 0.0350 | 25  |   |
| Xylenes                   |          | 150   | ug/L  | 0.626  | 1.19   | 25  |   |

\* Exceeds %D Criteria

CCV - Modified 03/05/2008  
 PDF File ID: 5511217  
 Report generated 10/09/2017 12:29

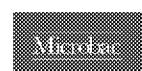


Microbac Laboratories Inc.  
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number:L17091702 Run Date:10/04/2017 Sample ID:WG632477-02  
Instrument ID:HPMS8 Run Time:11:55 Method:8260B  
File ID:8M421915 Analyst:HRF QC Key:DOWWVO2012  
Workgroup (AAB#):WG632478 Cal ID: HPMS8 - 13-SEP-17  
Matrix:WATER

| Analyte                                 | Expected | Found | UNITS | RF | %D | UCL | Q |
|---|----------|-------|-------|----|----|-----|---|
| CCC Calibration Check Compounds         |          |       |       |    |    |     |   |
| SPCC System Performance Check Compounds |          |       |       |    |    |     |   |

CCV - Modified 03/05/2008  
PDF File ID: 5511217  
Report generated 10/09/2017 12:29



Login Number: L17091702 Run Date: 10/05/2017 Sample ID: WG632679-02  
 Instrument ID: HPMS8 Run Time: 10:00 Method: 8260B  
 File ID: 8M421946 Analyst: HRF QC Key: DOWWVO2012  
 Workgroup (AAB#): WG632680 Cal ID: HPMS8 - 13-SEP-17  
 Matrix: WATER

| Analyte                   | Expected | Found | UNITS | RF    | %D     | UCL    | Q  |
|---------------------------|----------|-------|-------|-------|--------|--------|----|
| 1,1-Dichloroethene        | CCC      | 50.0  | ug/L  | 0.534 | 3.09   | 25     |    |
| 1,2-Dichloropropane       | CCC      | 50.0  | ug/L  | 0.356 | 2.09   | 25     |    |
| Chloroform                | CCC      | 50.0  | ug/L  | 0.497 | 4.05   | 25     |    |
| Ethylbenzene              | CCC      | 50.0  | ug/L  | 0.514 | 1.22   | 25     |    |
| Toluene                   | CCC      | 50.0  | ug/L  | 1.40  | 1.11   | 25     |    |
| Vinyl Chloride            | CCC      | 50.0  | 52.8  | ug/L  | 0.358  | 5.64   | 25 |
| Bromoform                 | SPCC     | 50.0  | ug/L  | 0.208 | 0.299  | 25     |    |
| 1,1,2,2-Tetrachloroethane | SPCC     | 50.0  | 51.4  | ug/L  | 0.496  | 2.80   | 25 |
| 1,1-Dichloroethane        | SPCC     | 50.0  | 49.1  | ug/L  | 0.613  | 1.77   | 25 |
| Chlorobenzene             | SPCC     | 50.0  | 47.8  | ug/L  | 0.955  | 4.39   | 25 |
| Chloromethane             | SPCC     | 50.0  | 47.4  | ug/L  | 0.667  | 5.19   | 25 |
| m-,p-Xylene               |          | 100   | ug/L  | 0.624 | 0.278  | 25     |    |
| o-Xylene                  |          | 50.0  | 50.2  | ug/L  | 0.614  | 0.429  | 25 |
| 1,1,2-Trichloroethane     |          | 50.0  | 49.3  | ug/L  | 0.240  | 1.49   | 25 |
| 1,2-Dichloroethane        |          | 50.0  | 49.1  | ug/L  | 0.443  | 1.89   | 25 |
| 1,2,4-Trimethylbenzene    |          | 50.0  | 52.4  | ug/L  | 2.61   | 4.81   | 25 |
| 1,4-Dichlorobenzene       |          | 50.0  | 49.4  | ug/L  | 1.54   | 1.27   | 25 |
| 1,3,5-Trimethylbenzene    |          | 50.0  | 52.4  | ug/L  | 2.53   | 4.73   | 25 |
| 1,3-Dichlorobenzene       |          | 50.0  | 50.4  | ug/L  | 1.56   | 0.849  | 25 |
| 2-Butanone                |          | 50.0  | 43.0  | ug/L  | 0.122  | 13.9   | 25 |
| 4-Methyl-2-Pentanone      |          | 50.0  | 44.4  | ug/L  | 0.0845 | 11.1   | 25 |
| Acetone                   |          | 50.0  | 38.6  | ug/L  | 0.0696 | 22.8   | 25 |
| 2-Hexanone                |          | 50.0  | 42.3  | ug/L  | 0.0890 | 15.4   | 25 |
| Benzene                   |          | 50.0  | 51.3  | ug/L  | 1.10   | 2.51   | 25 |
| Bromodichloromethane      |          | 50.0  | 52.4  | ug/L  | 0.394  | 4.83   | 25 |
| Bromomethane              |          | 50.0  | 45.3  | ug/L  | 0.216  | 9.36   | 25 |
| Carbon Disulfide          |          | 50.0  | 52.9  | ug/L  | 0.906  | 5.88   | 25 |
| Carbon Tetrachloride      |          | 50.0  | 52.6  | ug/L  | 0.469  | 5.23   | 25 |
| Dibromochloromethane      |          | 50.0  | 51.7  | ug/L  | 0.349  | 3.33   | 25 |
| Dichlorodifluoromethane   |          | 50.0  | 48.8  | ug/L  | 0.417  | 2.41   | 25 |
| cis-1,2-Dichloroethene    |          | 50.0  | 49.5  | ug/L  | 0.305  | 0.922  | 25 |
| Diethyl ether             |          | 100   | 79.8  | ug/L  | 0.220  | 20.2   | 25 |
| Methylene Chloride        |          | 50.0  | 48.7  | ug/L  | 0.267  | 2.67   | 25 |
| Naphthalene               |          | 50.0  | 46.8  | ug/L  | 1.48   | 6.42   | 25 |
| Styrene                   |          | 50.0  | 53.2  | ug/L  | 1.06   | 6.42   | 25 |
| Tetrachloroethene         |          | 50.0  | 47.6  | ug/L  | 0.297  | 4.81   | 25 |
| trans-1,2-Dichloroethene  |          | 50.0  | 49.2  | ug/L  | 0.513  | 1.54   | 25 |
| Trichloroethene           |          | 50.0  | 53.9  | ug/L  | 0.322  | 7.89   | 25 |
| Trichlorofluoromethane    |          | 50.0  | 53.0  | ug/L  | 0.538  | 6.05   | 25 |
| Xylenes                   |          | 150   | 150   | ug/L  | 0.619  | 0.0421 | 25 |

\* Exceeds %D Criteria

CCV - Modified 03/05/2008  
 PDF File ID: 5511217  
 Report generated 10/09/2017 12:29

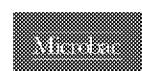


Microbac Laboratories Inc.  
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number:L17091702 Run Date:10/05/2017 Sample ID:WG632679-02  
Instrument ID:HPMS8 Run Time:10:00 Method:8260B  
File ID:8M421946 Analyst:HRF QC Key:DOWWVO2012  
Workgroup (AAB#):WG632680 Cal ID: HPMS8 - 13-SEP-17  
Matrix:WATER

| Analyte                                 | Expected | Found | UNITS | RF | %D | UCL | Q |
|---|----------|-------|-------|----|----|-----|---|
| CCC Calibration Check Compounds         |          |       |       |    |    |     |   |
| SPCC System Performance Check Compounds |          |       |       |    |    |     |   |

CCV - Modified 03/05/2008  
PDF File ID: 5511217  
Report generated 10/09/2017 12:29



Microbac Laboratories Inc.  
INTERNAL STANDARD AREA SUMMARY  
(COMPARED TO CCV)

Login Number:L17091702  
Instrument ID:HPMS8  
Workgroup (AAB#):WG632478

CCV Number:WG632477-02  
CAL ID:HPMS8 - 13-SEP-17  
Matrix:WATER

| Sample Number | Dilution | Tag | IS-1   | IS-2   | IS-3    |
|---------------|----------|-----|--------|--------|---------|
| WG632477-02   | NA       | NA  | 256830 | 463854 | 553567  |
| Upper Limit   | NA       | NA  | 513660 | 927708 | 1107134 |
| Lower Limit   | NA       | NA  | 128415 | 231927 | 276784  |
| L17091702-11  | 1.00     | 01  | 245113 | 447684 | 533958  |
| WG632478-01   | 1.00     | 01  | 244761 | 452255 | 542814  |
| WG632478-02   | 1.00     | 01  | 253919 | 459471 | 543351  |
| WG632478-06   | 1.00     | 01  | 238098 | 439500 | 525208  |

IS-1 - 1,4-Dichlorobenzene-d4  
IS-2 - Chlorobenzene-d5  
IS-3 - Fluorobenzene

Underline = Response outside limits

INTERNAL\_STD - Modified 03/06/2008  
PDF File ID: 5511219  
Report generated 10/05/2017 10:03



Microbac Laboratories Inc.  
INTERNAL STANDARD AREA SUMMARY  
(COMPARED TO MIDPOINT OF ICAL)

Login Number:L17091702  
Instrument ID:HPMS8  
Workgroup (AAB#):WG632478

ICAL CCV Number:WG629567-08  
CAL ID: HPMS8 - 13-SEP-17  
Matrix:WATER

| Sample Number       | Dilution | Tag | IS-1   | IS-2    | IS-3          |
|---------------------|----------|-----|--------|---------|---------------|
| WG629567-08         | NA       | NA  | 362138 | 640126  | <u>767485</u> |
| Upper Limit         | NA       | NA  | 724276 | 1280252 | 1534970       |
| Lower Limit         | NA       | NA  | 181069 | 320063  | 383743        |
| <u>L17091702-11</u> | 1.00     | 01  | 245113 | 447684  | 533958        |
| WG632478-01         | 1.00     | 01  | 244761 | 452255  | 542814        |
| WG632478-02         | 1.00     | 01  | 253919 | 459471  | 543351        |

IS-1 - 1,4-Dichlorobenzene-d4

IS-2 - Chlorobenzene-d5

IS-3 - Fluorobenzene

Underline = Response outside limits

INTERNAL\_STD\_ICAL - Modified 03/06/2008  
PDF File ID: 5518098  
Report generated 10/09/2017 14:19



Microbac Laboratories Inc.  
INTERNAL STANDARD AREA SUMMARY  
(COMPARED TO MIDPOINT OF ICAL)

Login Number:L17091702  
Instrument ID:HPMS8  
Workgroup (AAB#):WG632680

ICAL CCV Number:WG629567-08  
CAL ID: HPMS8 - 13-SEP-17  
Matrix:WATER

| Sample Number | Dilution | Tag | IS-1   | IS-2    | IS-3    |
|---------------|----------|-----|--------|---------|---------|
| WG629567-08   | NA       | NA  | 362138 | 640126  | 767485  |
| Upper Limit   | NA       | NA  | 724276 | 1280252 | 1534970 |
| Lower Limit   | NA       | NA  | 181069 | 320063  | 383743  |
| L17091702-01  | 1.00     | 01  | 258541 | 481760  | 566904  |
| L17091702-02  | 1.00     | 01  | 262035 | 468665  | 559277  |
| L17091702-03  | 1.00     | 01  | 267221 | 477471  | 559292  |
| L17091702-04  | 1.00     | 01  | 266787 | 484904  | 561452  |
| L17091702-05  | 1.00     | 01  | 271643 | 495963  | 570949  |
| L17091702-06  | 1.00     | 01  | 261487 | 464631  | 545947  |
| L17091702-07  | 1.00     | 01  | 261676 | 468192  | 549575  |
| L17091702-08  | 1.00     | 01  | 259650 | 471116  | 547302  |
| L17091702-09  | 1.00     | 01  | 258914 | 467441  | 554755  |
| L17091702-10  | 1.00     | 01  | 254876 | 467978  | 549305  |
| WG632680-01   | 1.00     | 01  | 252775 | 464581  | 545260  |
| WG632680-02   | 1.00     | 01  | 256996 | 463559  | 548171  |

IS-1 - 1,4-Dichlorobenzene-d4

IS-2 - Chlorobenzene-d5

IS-3 - Fluorobenzene

Underline = Response outside limits

INTERNAL\_STD\_ICAL - Modified 03/06/2008  
PDF File ID: 5518098  
Report generated 10/09/2017 14:19



Microbac Laboratories Inc.  
INTERNAL STANDARD RETENTION TIME SUMMARY  
(COMPARED TO CCV)

Login Number:L17091702  
Instrument ID:HPMS8  
Workgroup (AAB#):WG632478

CCV Number:WG632477-02  
CAL ID:HPMS8 - 13-SEP-17  
Matrix:WATER

| Sample Number | Dilution | Tag | IS-1  | IS-2  | IS-3  |
|---------------|----------|-----|-------|-------|-------|
| WG632477-02   | NA       | NA  | 17.74 | 14.72 | 10.85 |
| Upper Limit   | NA       | NA  | 18.24 | 15.22 | 11.35 |
| Lower Limit   | NA       | NA  | 17.24 | 14.22 | 10.35 |
| L17091702-11  | 1.00     | 01  | 17.73 | 14.72 | 10.85 |
| WG632478-01   | 1.00     | 01  | 17.74 | 14.72 | 10.84 |
| WG632478-02   | 1.00     | 01  | 17.73 | 14.72 | 10.85 |
| WG632478-06   | 1.00     | 01  | 17.74 | 14.72 | 10.85 |

IS-1 - 1,4-Dichlorobenzene-d4  
IS-2 - Chlorobenzene-d5  
IS-3 - Fluorobenzene

Underline = Response outside limits

INTERNAL\_STD\_RT - Modified 03/06/2008  
PDF File ID: 5511221  
Report generated 10/05/2017 10:03



Microbac Laboratories Inc.  
INTERNAL STANDARD RETENTION TIME SUMMARY  
(COMPARED TO MIDPOINT OF ICAL)

Login Number:L17091702  
Instrument ID:HPMS8  
Workgroup (AAB#):WG632478

ICAL CCV Number:WG629567-08  
CAL ID: HPMS8 - 13-SEP-17  
Matrix:WATER

| Sample Number       | Dilution | Tag | IS-1  | IS-2  | IS-3  |
|---------------------|----------|-----|-------|-------|-------|
| WG629567-08         | NA       | NA  | 17.79 | 14.76 | 10.89 |
| Upper Limit         | NA       | NA  | 18.29 | 15.26 | 11.39 |
| Lower Limit         | NA       | NA  | 17.29 | 14.26 | 10.39 |
| <u>L17091702-11</u> | 1.00     | 01  | 17.73 | 14.72 | 10.85 |
| WG632478-01         | 1.00     | 01  | 17.74 | 14.72 | 10.84 |
| WG632478-02         | 1.00     | 01  | 17.73 | 14.72 | 10.85 |

IS-1 - 1,4-Dichlorobenzene-d4

IS-2 - Chlorobenzene-d5

IS-3 - Fluorobenzene

Underline = Response outside limits

INTERNAL\_STD\_RT\_ICAL - Modified 03/06/2008  
PDF File ID: 5518099  
Report generated: 10/09/2017 14:19



Microbac Laboratories Inc.  
INTERNAL STANDARD RETENTION TIME SUMMARY  
(COMPARED TO MIDPOINT OF ICAL)

Login Number:L17091702  
Instrument ID:HPMS8  
Workgroup (AAB#):WG632680

ICAL CCV Number:WG629567-08  
CAL ID: HPMS8 - 13-SEP-17  
Matrix:WATER

| Sample Number | Dilution | Tag | IS-1  | IS-2  | IS-3  |
|---------------|----------|-----|-------|-------|-------|
| WG629567-08   | NA       | NA  | 17.79 | 14.76 | 10.89 |
| Upper Limit   | NA       | NA  | 18.29 | 15.26 | 11.39 |
| Lower Limit   | NA       | NA  | 17.29 | 14.26 | 10.39 |
| L17091702-01  | 1.00     | 01  | 17.73 | 14.72 | 10.85 |
| L17091702-02  | 1.00     | 01  | 17.73 | 14.72 | 10.85 |
| L17091702-03  | 1.00     | 01  | 17.73 | 14.72 | 10.85 |
| L17091702-04  | 1.00     | 01  | 17.73 | 14.72 | 10.85 |
| L17091702-05  | 1.00     | 01  | 17.74 | 14.71 | 10.84 |
| L17091702-06  | 1.00     | 01  | 17.74 | 14.72 | 10.85 |
| L17091702-07  | 1.00     | 01  | 17.73 | 14.72 | 10.85 |
| L17091702-08  | 1.00     | 01  | 17.73 | 14.71 | 10.85 |
| L17091702-09  | 1.00     | 01  | 17.74 | 14.72 | 10.85 |
| L17091702-10  | 1.00     | 01  | 17.73 | 14.72 | 10.85 |
| WG632680-01   | 1.00     | 01  | 17.74 | 14.72 | 10.85 |
| WG632680-02   | 1.00     | 01  | 17.74 | 14.71 | 10.84 |

IS-1 - 1,4-Dichlorobenzene-d4  
IS-2 - Chlorobenzene-d5  
IS-3 - Fluorobenzene

Underline = Response outside limits

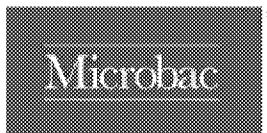
INTERNAL\_STD\_RT\_ICAL - Modified 03/06/2008  
PDF File ID: 5518099  
Report generated: 10/09/2017 14:19



## **2.1 Volatiles Data**

## **2.1.2 RSK 175**

## **2.1.2.1 Summary Data**



**Login Number:** L17091702  
**Department:** Volatiles - GC  
**Analyst:** Heather Fairchild

## Analysis RSK-175

### HOLDING TIMES

**Sample Preparation:** All holding times were met.

**Sample Analysis:** All holding times were met.

### PREPARATION

Sample preparation proceeded normally.

### CALIBRATION

**Initial Calibration:** For all compounds that yielded a %RSD greater than 15%, linear or higher order equations were applied. All acceptance criteria were met.

**Alternate Source Standards:** All acceptance criteria were met.

**Continuing Calibration and Tune:** All acceptance criteria were met.

### BATCH QA/QC

**Method Blank:** All acceptance criteria were met.

**Laboratory Control Sample:** All acceptance criteria were met.

**Matrix Spikes/Sample Duplicates:** The MS/MSD results were not associated with this sample delivery group (SDG), due to insufficient volume of sample. Microbac Laboratories recommends site specific MS/MSD samples to avoid possible data qualifications.

### SAMPLES

**Samples:** Samples 01, 02, 03, 04, 05, 06, 07, and 10 required dilution analyses.

## Manual Integration Reason Codes

**Reason #1: Data System Fails to Select Correct Peak** In some cases the chromatography system selects and integrates the 'wrong peak'. In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

**Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak** This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low area counts for the target compound.

**Reason #3: Improperly Integrated Isomers and/or coeluting compounds.** This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

**Reason #4: System Establishes Incorrect Baseline** There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and should be corrected via manual procedures.

**Reason #5: Miscellaneous** Other situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the laboratory management. If the form of manual integration is not clearly covered by these four cases, then review and approval by the Laboratory Director or the QA/QC Supervisor will be required.

**Narrative ID:** 130127

**Approved By:** Sarah Vandenberg

*Sarah Vandenberg*

## Certificate of Analysis

|               |                  |                    |        |             |                  |
|---------------|------------------|--------------------|--------|-------------|------------------|
| Sample #:     | L17091702-01     | PrePrep Method:    | N/A    | Instrument: | HP16             |
| Client ID:    | 0293-PW-092617   | Prep Method:       | 5021   | Prep Date:  | N/A              |
| Matrix:       | Water            | Analytical Method: | RSK175 | Cal Date:   | 07/19/2017 11:32 |
| Workgroup #:  | WG632131         | Analyst:           | HRF    | Run Date:   | 10/02/2017 16:49 |
| Collect Date: | 09/26/2017 14:25 | Dilution:          | 10     | File ID:    | 16G53528         |
| Sample Tag:   | DL01             | Units:             | ug/L   |             |                  |

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 7410   |      | 50.0 | 10.0 |

|               |                  |                    |        |             |                  |
|---------------|------------------|--------------------|--------|-------------|------------------|
| Sample #:     | L17091702-02     | PrePrep Method:    | N/A    | Instrument: | HP16             |
| Client ID:    | 0293-PW-092617D  | Prep Method:       | 5021   | Prep Date:  | N/A              |
| Matrix:       | Water            | Analytical Method: | RSK175 | Cal Date:   | 07/19/2017 11:32 |
| Workgroup #:  | WG632131         | Analyst:           | HRF    | Run Date:   | 10/02/2017 17:01 |
| Collect Date: | 09/26/2017 14:30 | Dilution:          | 10     | File ID:    | 16G53529         |
| Sample Tag:   | DL01             | Units:             | ug/L   |             |                  |

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 8430   |      | 50.0 | 10.0 |

|               |                  |                    |        |             |                  |
|---------------|------------------|--------------------|--------|-------------|------------------|
| Sample #:     | L17091702-03     | PrePrep Method:    | N/A    | Instrument: | HP16             |
| Client ID:    | 0297-PW-092617   | Prep Method:       | 5021   | Prep Date:  | N/A              |
| Matrix:       | Water            | Analytical Method: | RSK175 | Cal Date:   | 07/19/2017 11:32 |
| Workgroup #:  | WG631960         | Analyst:           | HRF    | Run Date:   | 09/29/2017 18:49 |
| Collect Date: | 09/26/2017 15:40 | Dilution:          | 5      | File ID:    | 16G53510         |
| Sample Tag:   | DL01             | Units:             | ug/L   |             |                  |

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 635    |      | 25.0 | 5.00 |

|               |                  |                    |        |             |                  |
|---------------|------------------|--------------------|--------|-------------|------------------|
| Sample #:     | L17091702-04     | PrePrep Method:    | N/A    | Instrument: | HP16             |
| Client ID:    | 0297-PW-092617MS | Prep Method:       | 5021   | Prep Date:  | N/A              |
| Matrix:       | Water            | Analytical Method: | RSK175 | Cal Date:   | 07/19/2017 11:32 |
| Workgroup #:  | WG631960         | Analyst:           | HRF    | Run Date:   | 09/29/2017 18:25 |
| Collect Date: | 09/26/2017 15:40 | Dilution:          | 5      | File ID:    | 16G53508         |
| Sample Tag:   | DL01             | Units:             | ug/L   |             |                  |

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 1270   |      | 25.0 | 5.00 |

## Certificate of Analysis

|                                |                           |                            |
|--------------------------------|---------------------------|----------------------------|
| Sample #: L17091702-05         | PrePrep Method: N/A       | Instrument: HP16           |
| Client ID: 0297-PW-092617SD    | Prep Method: 5021         | Prep Date: N/A             |
| Matrix: Water                  | Analytical Method: RSK175 | Cal Date: 07/19/2017 11:32 |
| Workgroup #: WG631960          | Analyst: HRF              | Run Date: 09/29/2017 18:37 |
| Collect Date: 09/26/2017 15:40 | Dilution: 5               | File ID: 16G53509          |
| Sample Tag: DL01               | Units: ug/L               |                            |

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 1270   |      | 25.0 | 5.00 |

|                                |                           |                            |
|--------------------------------|---------------------------|----------------------------|
| Sample #: L17091702-06         | PrePrep Method: N/A       | Instrument: HP16           |
| Client ID: 0019-PW-092717      | Prep Method: 5021         | Prep Date: N/A             |
| Matrix: Water                  | Analytical Method: RSK175 | Cal Date: 07/19/2017 11:32 |
| Workgroup #: WG632131          | Analyst: HRF              | Run Date: 10/02/2017 17:13 |
| Collect Date: 09/27/2017 10:45 | Dilution: 20              | File ID: 16G53530          |
| Sample Tag: DL01               | Units: ug/L               |                            |

| Analyte | CAS #   | Result | Qual | RL  | MDL  |
|---------|---------|--------|------|-----|------|
| Methane | 74-82-8 | 7500   |      | 100 | 20.0 |

|                                |                           |                            |
|--------------------------------|---------------------------|----------------------------|
| Sample #: L17091702-07         | PrePrep Method: N/A       | Instrument: HP16           |
| Client ID: 0298-PW-092717      | Prep Method: 5021         | Prep Date: N/A             |
| Matrix: Water                  | Analytical Method: RSK175 | Cal Date: 07/19/2017 11:32 |
| Workgroup #: WG632131          | Analyst: HRF              | Run Date: 10/02/2017 17:25 |
| Collect Date: 09/27/2017 11:40 | Dilution: 5               | File ID: 16G53531          |
| Sample Tag: DL01               | Units: ug/L               |                            |

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 1670   |      | 25.0 | 5.00 |

|                                |                           |                            |
|--------------------------------|---------------------------|----------------------------|
| Sample #: L17091702-08         | PrePrep Method: N/A       | Instrument: HP16           |
| Client ID: 0300-PW-092717      | Prep Method: 5021         | Prep Date: N/A             |
| Matrix: Water                  | Analytical Method: RSK175 | Cal Date: 07/19/2017 11:32 |
| Workgroup #: WG631960          | Analyst: HRF              | Run Date: 09/29/2017 17:15 |
| Collect Date: 09/27/2017 14:00 | Dilution: 1               | File ID: 16G53502          |
| Sample Tag: 01                 | Units: ug/L               |                            |

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 597    |      | 5.00 | 1.00 |

## Certificate of Analysis

Sample #: L17091702-09      PrePrep Method: N/A      Instrument: HP16  
Client ID: 0301-PW-092717      Prep Method: 5021      Prep Date: N/A  
Matrix: Water      Analytical Method: RSK175      Cal Date: 07/19/2017 11:32  
Workgroup #: WG631960      Analyst: HRF      Run Date: 09/29/2017 17:26  
Collect Date: 09/27/2017 15:55      Dilution: 1      File ID: 16G53503  
Sample Tag: 01      Units: ug/L

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 109    |      | 5.00 | 1.00 |

Sample #: L17091702-10      PrePrep Method: N/A      Instrument: HP16  
Client ID: 0305-PW-092717      Prep Method: 5021      Prep Date: N/A  
Matrix: Water      Analytical Method: RSK175      Cal Date: 07/19/2017 11:32  
Workgroup #: WG632131      Analyst: HRF      Run Date: 10/02/2017 17:36  
Collect Date: 09/27/2017 16:55      Dilution: 10      File ID: 16G53532  
Sample Tag: DL01      Units: ug/L

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 5890   |      | 50.0 | 10.0 |

## **2.1.2.2 QC Summary Data**



**Login Number:** L17091702  
**Department:** Volatiles - GC  
**Analyst:** Heather Fairchild

## Analysis RSK-175

### HOLDING TIMES

**Sample Preparation:** All holding times were met.

**Sample Analysis:** All holding times were met.

### PREPARATION

Sample preparation proceeded normally.

### CALIBRATION

**Initial Calibration:** For all compounds that yielded a %RSD greater than 15%, linear or higher order equations were applied. All acceptance criteria were met.

**Alternate Source Standards:** All acceptance criteria were met.

**Continuing Calibration and Tune:** All acceptance criteria were met.

### BATCH QA/QC

**Method Blank:** All acceptance criteria were met.

**Laboratory Control Sample:** All acceptance criteria were met.

**Matrix Spikes/Sample Duplicates:** The MS/MSD results were not associated with this sample delivery group (SDG), due to insufficient volume of sample. Microbac Laboratories recommends site specific MS/MSD samples to avoid possible data qualifications.

### SAMPLES

**Samples:** Samples 01, 02, 03, 04, 05, 06, 07, and 10 required dilution analyses.

## **Manual Integration Reason Codes**

**Reason #1: Data System Fails to Select Correct Peak** In some cases the chromatography system selects and integrates the 'wrong peak'. In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

**Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak** This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low area counts for the target compound.

**Reason #3: Improperly Integrated Isomers and/or coeluting compounds.** This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

**Reason #4: System Establishes Incorrect Baseline** There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and should be corrected via manual procedures.

**Reason #5: Miscellaneous** Other situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the laboratory management. If the form of manual integration is not clearly covered by these four cases, then review and approval by the Laboratory Director or the QA/QC Supervisor will be required.

**Narrative ID:** 130127

**Approved By:** Sarah Vandenberg

*Sarah Vandenberg*

## Microbac Laboratories Inc.

## Data Checklist

Date: 19-JUL-2017

Analyst: HRF

Analyst: NA

Method: RSK175EXT

Instrument: HP16

Curve Workgroup: NA

Runlog ID: 83462

Analytical Workgroups: WG622365 WG622324

|  |     |
|--|-----|
| Initial Calibration  | X   |
| Average RF   | X   |
| Linear Reg or Higher Order Curve                                   | X   |
| Second Source standard % Difference                                | X   |
| Continuing Calibration /Check Standards                            | X   |
| Project/Client Specific Requirements                               | X   |
| Special Standards  | NA  |
| Blanks   | X   |
| TCL's  | X   |
| Surrogates   | NA  |
| LCS (Laboratory Control Sample)                                    | X   |
| Recoveries   | X   |
| Surrogates   | NA  |
| MS/MSD/Duplicates  | NA  |
| Samples  | X   |
| Surrogates   | NA  |
| Calculations & Correct Factors                                     | X   |
| Dilutions Run  | NA  |
| Reruns   | NA  |
| Manual Integrations  | NA  |
| Case Narrative   | NA  |
| Results Reporting/Data Qualifiers                                  | X   |
| KOBRA Workgroup Data   | X   |
| Check for Completeness   | X   |
| Primary Reviewer   | HRF |
| Secondary Reviewer   | ADC |
|  |     |
| Check for compliance with method and project specific requirements | X   |
| Check the completeness of reported information                     | X   |
| Check the information for the report narrative                     | X   |
| Check the reasonableness of the results                            | X   |

Primary Reviewer:  
21-JUL-2017Secondary Reviewer:  
24-JUL-2017

## Microbac Laboratories Inc.

## Data Checklist

Date: 29-SEP-2017

Analyst: HRF

Analyst: NA

Method: RSK175

Instrument: HP16

Curve Workgroup: NA

Runlog ID: 84963

Analytical Workgroups: WG631960

|  |     |
|--|-----|
| Initial Calibration  | X   |
| Average RF   | X   |
| Linear Reg or Higher Order Curve                                   | X   |
| Second Source standard % Difference                                | X   |
| Continuing Calibration /Check Standards                            | X   |
| Project/Client Specific Requirements                               | X   |
| Special Standards  | NA  |
| Blanks   | X   |
| TCL's  | X   |
| Surrogates   | NA  |
| LCS (Laboratory Control Sample)                                    | X   |
| Recoveries   | X   |
| Surrogates   | NA  |
| MS/MSD/Duplicates  | X   |
| Samples  | X   |
| Surrogates   | NA  |
| Calculations & Correct Factors                                     | X   |
| Dilutions Run  | X   |
| Reruns   | X   |
| Manual Integrations  | NA  |
| Case Narrative   | X   |
| Results Reporting/Data Qualifiers                                  | X   |
| KOBRA Workgroup Data   | X   |
| Check for Completeness   | X   |
| Primary Reviewer   | HRF |
| Secondary Reviewer   | ADC |
|  |     |
| Check for compliance with method and project specific requirements | X   |
| Check the completeness of reported information                     | X   |
| Check the information for the report narrative                     | X   |
| Check the reasonableness of the results                            | X   |

Primary Reviewer:  
02-OCT-2017Secondary Reviewer:  
02-OCT-2017

## Microbac Laboratories Inc.

## Data Checklist

Date: 02-OCT-2017

Analyst: HRF

Analyst: NA

Method: RSK175

Instrument: HP16

Curve Workgroup: NA

Runlog ID: 84997

Analytical Workgroups: WG632131

|  |     |
|--|-----|
| Initial Calibration  | X   |
| Average RF   | X   |
| Linear Reg or Higher Order Curve                                   | X   |
| Second Source standard % Difference                                | X   |
| Continuing Calibration /Check Standards                            | X   |
| Project/Client Specific Requirements                               | X   |
| Special Standards  | NA  |
| Blanks   | X   |
| TCL's  | X   |
| Surrogates   | NA  |
| LCS (Laboratory Control Sample)                                    | X   |
| Recoveries   | X   |
| Surrogates   | NA  |
| MS/MSD/Duplicates  | NA  |
| Samples  | X   |
| Surrogates   | NA  |
| Calculations & Correct Factors                                     | X   |
| Dilutions Run  | X   |
| Reruns   | X   |
| Manual Integrations  | NA  |
| Case Narrative   | X   |
| Results Reporting/Data Qualifiers                                  | X   |
| KOBRA Workgroup Data   | X   |
| Check for Completeness   | X   |
| Primary Reviewer   | HRF |
| Secondary Reviewer   | SAV |
|  |     |
| Check for compliance with method and project specific requirements | X   |
| Check the completeness of reported information                     | X   |
| Check the information for the report narrative                     | X   |
| Check the reasonableness of the results                            | X   |

Primary Reviewer:  
04-OCT-2017Secondary Reviewer:  
04-OCT-2017

## RSK-175 - Example Calculation for Methane

### 1.0 Linear Calibration Models

#### Option A - Average RF Method

| ICAL_x      | ICAL_r  | RF    |
|-------------|---------|-------|
| 1.67        | 19901   | 11917 |
| 6.67        | 69174   | 10371 |
| 16.7        | 176923  | 10594 |
| 66.7        | 685135  | 10272 |
| 133         | 1324853 | 9961  |
| 300         | 2845104 | 9484  |
| Average RF: |         | 10433 |

Where:

ICAL\_x = the ICAL concentration

ICAL\_r = the ICAL response (area)

RF = calibration factor = ICAL\_r / ICAL\_x

#### Option B - Agilent Linear Regression Constant

| ICAL_x                               | ICAL_r  | [ICAL_r]^2  | [ICAL_x][ICAL_r] |
|--------------------------------------|---------|-------------|------------------|
| 1.67                                 | 19901   | 396049801   | 33235            |
| 6.67                                 | 69174   | 4785042276  | 461391           |
| 16.7                                 | 176923  | 31301747929 | 2954614          |
| 66.7                                 | 685135  | 4.6941E+11  | 45698505         |
| 133                                  | 1324853 | 1.75524E+12 | 176205449        |
| 300                                  | 2845104 | 8.09462E+12 | 853531200        |
| Summation:                           |         | 1.03557E+13 | 1078884393       |
| Agilent Linear Regression Constant : |         |             | 9598.567853      |
| (1.03557E+13)/1078884393)            |         |             |                  |

### 2.0 Calculate the concentration in extract, Cx

Where:

|   |             |
|---|-------------|
| y = area response of methane from quant report  | 1157414     |
| a = average RF (or Agilent regression constant) | 10433.00    |
| Cx = y/a  | 110.9377935 |

### 3.0 Calculate the concentration in sample

$$Cs = Cx \cdot (MW/Tf) \cdot (HS/S) \cdot (DF)$$

Where:

|   |                      |
|---|----------------------|
| Cx = Concentration in extract                       | 110.9377935 umol/mol |
| MW = molecular weight of analyte                    | 16.04 ug/umol        |
| TF = temperature factor = (22.4 )(313/273)          | 25.68 L/mol          |
| HS = headspace volume                               | 0.015 L              |
| S = sample volume remaining after headspace removal | 0.00547 L            |
| DF = dilution factor                                | 2                    |
| Cs = calculated sample concentration                | 380.034301 ug/L      |

## RSK-175 - Example Calculation for Carbon Dioxide

ICAL Plot - Quadratic Regression (  $y = Ax^2 + Bx + C$  )

$$Ax^2 + Bx + (C - y) = 0$$

### Step 1 - Calculate the concentration in extract, C<sub>x</sub>

Data from quadratic regression plot:

|  |          |
|--|----------|
| Value of A from plot:                              | 0.916    |
| Value of B from plot:                              | 1540     |
| Value of C from plot:                              | 0        |
| Response for methane from quantitation report (y): | 8763828  |
| Value of C - y                                     | -8763828 |

Solving for C<sub>x</sub> using the quadratic formula:

|                                     |                      |
|-------------------------------------|----------------------|
| Root 1 - Computed C <sub>x1</sub> : | 2364.716284 umol/mol |
| Root 2 - Computed C <sub>x2</sub> : | -4045.938991         |

### Step 2 - Calculate the concentration in sample

$$C_s = C_x \times (MW/Tf) \times (HS/S) \times (DF)$$

Where:

C<sub>x</sub> = Concentration in extract :

2364.716284 umol/mol

44.0 ug/umol

MW = molecular weight of analyte:

25.68 L/mol

TF = temperature factor = (22.4 )(313/273):

0.015 L

HS = initial headspace volume (extraction log):

0.00547 L

S = final volume (extraction log):

10

DF = dilution factor:

C<sub>s</sub> = calculated sample concentration:

111106.798 ug/L

### Other Notes:

Temperature of headspace = 40 C = 313 K

| Analyte        | MW (g/mol) |
|----------------|------------|
| Methane        | 16.04      |
| Ethane         | 30.07      |
| Ethene         | 28.05      |
| Propane        | 44.1       |
| Carbon Dioxide | 44.0       |

## Microbac Laboratories Inc.

## Instrument Run Log

|             |        |           |        |         |
|-------------|--------|-----------|--------|---------|
| Instrument: | HP16   | Dataset:  | 071917 |         |
| Analyst1:   | HRF    | Analyst2: | NA     |         |
| Method:     | RSK175 | SOP:      | RSK01  | Rev: 19 |
| Method:     | 5021   | SOP:      | RSK01  | Rev: 19 |

Maintenance Log ID: \_\_\_\_\_

|                       |                        |            |
|-----------------------|------------------------|------------|
| Internal Standard: NA | Surrogate Standard: NA |            |
| CCV: STD80684         | LCS: STD81961          | MS/MSD: NA |

Column 1 ID: RTQBOND      Column 2 ID: RTQBOND  
 Workgroups: WG622365 WG622324

Comments: \_\_\_\_\_

| File ID  | Sample Information                  | pH | Mat | Dil | Reference | Date/Time      |
|----------|-------------------------------------|----|-----|-----|-----------|----------------|
| 16G52891 | WG622323-01 133umol/mol CCV RSK175  | NA | 1   | 1   | STD80684  | 07/19/17 08:54 |
| 16G52892 | WG622323-01 133umol/mol CCV RSK175  | NA | 1   | 1   | STD80684  | 07/19/17 09:18 |
| 16G52893 | WG622365-01 0.67umol/mol RSK175     | NA | 1   | 1   | STD82803  | 07/19/17 09:59 |
| 16G52894 | WG622365-02 1.67umol/mol RSK175     | NA | 1   | 1   | STD82803  | 07/19/17 10:11 |
| 16G52895 | WG622365-03 33.3umol/mol RSK175     | NA | 1   | 1   | STD82803  | 07/19/17 10:23 |
| 16G52896 | WG622365-04 66.7umol/mol RSK175     | NA | 1   | 1   | STD80684  | 07/19/17 10:34 |
| 16G52897 | WG622365-05 133umol/mol RSK175      | NA | 1   | 1   | STD80684  | 07/19/17 10:45 |
| 16G52898 | WG622365-06 333umol/mol RSK175      | NA | 1   | 1   | STD80684  | 07/19/17 10:57 |
| 16G52899 | WG622365-07 533umol/mol RSK175      | NA | 1   | 1   | STD80684  | 07/19/17 11:08 |
| 16G52900 | RINSE                               | NA | 1   | 1   |           | 07/19/17 11:20 |
| 16G52901 | WG622365-02 1.67umol/mol LCS RSK175 | NA | 1   | 1   | STD80684  | 07/19/17 11:32 |
| 16G52902 | WG622365-08 ALT 66.7umol/mol RSK175 | NA | 1   | 1   | STD81961  | 07/19/17 12:06 |
| 16G52903 | WG622323-01 CCV 133umol/mol RSK175  | NA | 1   | 1   | STD80684  | 07/19/17 12:17 |
| 16G52904 | RINSE                               | NA | 1   | 1   |           | 07/19/17 12:29 |
| 16G52905 | WG622323-01 CCV 133umol/mol RSK175  | NA | 1   | 1   | STD80684  | 07/19/17 13:00 |
| 16G52906 | WG622324-01 BLANK RSK175            | NA | 1   | 1   |           | 07/19/17 13:23 |
| 16G52907 | L17070894-01 A RSK175               | 6  | 1   | 1   |           | 07/19/17 13:35 |
| 16G52908 | WG622324-02 67umol/mol LCS RSK175   | NA | 1   | 1   | STD81961  | 07/19/17 13:47 |
| 16G52909 | WG622324-03 67umol/mol LCS2 RSK175  | NA | 1   | 1   | STD81961  | 07/19/17 14:05 |
| 16G52910 | WG622324-02 67umol/mol LCS RSK175   | NA | 1   | 1   | STD81961  | 07/19/17 14:17 |
| 16G52911 | L17070822-01 A RSK175               | <2 | 1   | 1   |           | 07/19/17 14:29 |
| 16G52912 | L17070822-03 A RSK175               | <2 | 1   | 1   |           | 07/19/17 14:40 |
| 16G52913 | L17070822-05 A RSK175               | <2 | 1   | 1   |           | 07/19/17 14:51 |
| 16G52914 | L17070822-07 A RSK175               | <2 | 1   | 1   |           | 07/19/17 15:03 |
| 16G52915 | L17070822-09 A RSK175               | <2 | 1   | 1   |           | 07/19/17 15:14 |
| 16G52916 | WG622323-02 CCV 133umol/mol RSK175  | NA | 1   | 1   | STD80684  | 07/19/17 15:26 |
| 16G52917 | L17070822-11 A RSK175               | <2 | 1   | 1   |           | 07/19/17 15:38 |
| 16G52918 | L17070823-01 A RSK175               | <2 | 1   | 1   |           | 07/19/17 15:49 |
| 16G52919 | L17070824-01 A RSK175               | <2 | 1   | 1   |           | 07/19/17 16:00 |
| 16G52920 | L17070886-01 A RSK175               | <2 | 1   | 1   |           | 07/19/17 16:11 |
| 16G52921 | L17070889-01 A RSK175               | <2 | 1   | 1   |           | 07/19/17 16:22 |
| 16G52922 | WG622323-03 CCV 133umol/mol RSK175  | NA | 1   | 1   | STD80684  | 07/19/17 16:33 |

Approved: July 24, 2017

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## Microbac Laboratories Inc.

## Instrument Run Log

|             |        |           |        |
|-------------|--------|-----------|--------|
| Instrument: | HP16   | Dataset:  | 071917 |
| Analyst1:   | HRF    | Analyst2: | NA     |
| Method:     | RSK175 | SOP:      | RSK01  |
| Method:     | 5021   | SOP:      | RSK01  |
|             |        | Rev:      | 19     |
|             |        | Rev:      | 19     |

Maintenance Log ID: \_\_\_\_\_

|                               |          |                      |          |
|-------------------------------|----------|----------------------|----------|
| Internal Standard:            | NA       | Surrogate Standard:  | NA       |
| CCV:                          | STD80684 | LCS:                 | STD81961 |
| Column 1 ID: RTQBOND          |          | Column 2 ID: RTQBOND |          |
| Workgroups: WG622365 WG622324 |          |                      |          |

Comments: \_\_\_\_\_

Comments

| Seq.                                    | Rerun | Dil. | Reason | Analytes |
|---|-------|------|--------|----------|
| 1                                       |       |      |        |          |
| File ID:16G52891                        |       |      |        |          |
| WG622323-01 LOW FAILING CCV.            |       |      |        |          |
| 2                                       |       |      |        |          |
| File ID:16G52892                        |       |      |        |          |
| WG622323-01 HIGH FAILING CCV. RUN ICAL. |       |      |        |          |
| 4                                       | X     |      |        |          |
| File ID:16G52894                        |       |      |        |          |
| WG622365-02 RERUN 1.67umol/mol ICAL.    |       |      |        |          |
| 13                                      |       |      |        |          |
| File ID:16G52903                        |       |      |        |          |
| WG622323-01 N.D. FOR CO2. RERUN CCV.    |       |      |        |          |

Approved: July 24, 2017

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## Microbac Laboratories Inc.

## Instrument Run Log

|             |        |           |        |         |
|-------------|--------|-----------|--------|---------|
| Instrument: | HP16   | Dataset:  | 092917 |         |
| Analyst1:   | HRF    | Analyst2: | NA     |         |
| Method:     | RSK175 | SOP:      | RSK01  | Rev: 19 |
| Method:     | 5021   | SOP:      | RSK01  | Rev: 19 |

Maintenance Log ID: 54343

|                    |          |                     |          |
|--------------------|----------|---------------------|----------|
| Internal Standard: | NA       | Surrogate Standard: | NA       |
| CCV:               | STD80684 | LCS:                | STD81961 |
| MS/MSD:            |          | STD81961            |          |

Column 1 ID: RTQBOND      Column 2 ID: RTQBOND  
 Workgroups: \_\_\_\_\_

Comments: \_\_\_\_\_

| File ID  | Sample Information                 | pH | Mat | Dil | Reference | Date/Time      |
|----------|------------------------------------|----|-----|-----|-----------|----------------|
| 16G53490 | WG631959-01 133umol/mol CCV RSK175 | NA | 1   | 1   | STD80684  | 09/29/17 14:41 |
| 16G53491 | WG631960-01 BLANK RSK175           | NA | 1   | 1   |           | 09/29/17 14:53 |
| 16G53492 | WG631960-02 67umol/mol LCS RSK175  | NA | 1   | 1   | STD81961  | 09/29/17 15:12 |
| 16G53493 | L17091658-01 RSK175                | NA | 1   | 1   |           | 09/29/17 15:24 |
| 16G53494 | L17091702-04 MS RSK175             | <2 | 1   | 1   | STD81961  | 09/29/17 15:36 |
| 16G53495 | L17091702-05 MSD RSK175            | <2 | 1   | 1   | STD81961  | 09/29/17 15:48 |
| 16G53496 | L17091702-03 REF RSK175            | <2 | 1   | 1   |           | 09/29/17 16:00 |
| 16G53497 | L17091702-01 RSK175                | <2 | 1   | 1   |           | 09/29/17 16:11 |
| 16G53498 | L17091702-02 RSK175                | <2 | 1   | 1   |           | 09/29/17 16:24 |
| 16G53499 | L17091702-06 RSK175                | <2 | 1   | 1   |           | 09/29/17 16:35 |
| 16G53500 | L17091702-07 RSK175                | <2 | 1   | 1   |           | 09/29/17 16:46 |
| 16G53501 | WG631959-02 133umol/mol CCV RSK175 | NA | 1   | 1   | STD80684  | 09/29/17 16:58 |
| 16G53502 | L17091702-08 RSK175                | <2 | 1   | 1   |           | 09/29/17 17:15 |
| 16G53503 | L17091702-09 RSK175                | <2 | 1   | 1   |           | 09/29/17 17:26 |
| 16G53504 | L17091702-10 RSK175                | <2 | 1   | 1   |           | 09/29/17 17:38 |
| 16G53505 | L17091719-01 RSK175                | 7  | 1   | 1   |           | 09/29/17 17:49 |
| 16G53506 | L17091719-03 RSK175                | 6  | 1   | 1   |           | 09/29/17 18:01 |
| 16G53507 | L17091719-05 RSK175                | 6  | 1   | 1   |           | 09/29/17 18:14 |
| 16G53508 | L17091702-04 MS 5X RSK175          | <2 | 1   | 5   | STD81961  | 09/29/17 18:25 |
| 16G53509 | L17091702-05 MSD 5X RSK175         | <2 | 1   | 5   | STD81961  | 09/29/17 18:37 |
| 16G53510 | L17091702-03 REF 5X RSK175         | <2 | 1   | 5   |           | 09/29/17 18:49 |
| 16G53511 | WG631959-03 133umol/mol CCV RSK175 | NA | 1   | 1   | STD80681  | 09/29/17 19:00 |

Comments

| Seq.              | Rerun | Dil. | Reason   | Analytes |
|-------------------|-------|------|--|----------|
| 5                 | X     | 5    | Over Calibration Range   | METHANE  |
| File ID: 16G53494 |       |      |  |          |
|                   |       |      | L17091702-04 RERUN REF, MS, MSD AT 5X. METHANE OVER ICAL IN REF. |          |
| 6                 | X     | 5    | Over Calibration Range   | METHANE  |
| File ID: 16G53495 |       |      |  |          |
|                   |       |      | L17091702-05 RERUN REF, MS, MSD AT 5X                            |          |
| 7                 | X     | 5    | Over Calibration Range   | METHANE  |
| File ID: 16G53496 |       |      |  |          |
|                   |       |      | L17091702-03 RERUN REF, MS, MSD AT 5X                            |          |

Approved: October 02, 2017

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## Microbac Laboratories Inc.

## Instrument Run Log

|             |        |           |        |
|-------------|--------|-----------|--------|
| Instrument: | HP16   | Dataset:  | 092917 |
| Analyst1:   | HRF    | Analyst2: | NA     |
| Method:     | RSK175 | SOP:      | RSK01  |
| Method:     | 5021   | SOP:      | RSK01  |
|             |        | Rev:      | 19     |
|             |        | Rev:      | 19     |

Maintenance Log ID: 54343

|                    |          |                     |          |
|--------------------|----------|---------------------|----------|
| Internal Standard: | NA       | Surrogate Standard: | NA       |
| CCV:               | STD80684 | LCS:                | STD81961 |
| Column 1 ID:       | RTQBOND  | Column 2 ID:        | RTQBOND  |
| Workgroups:        |          |                     |          |

Comments: Comments

| Seq.  | Rerun | Dil. | Reason                   | Analytes        |
|---|-------|------|--------------------------|-----------------|
| 8   | X     | 10   | Over Calibration Range   | METHANE         |
| File ID: 16G53497   |       |      |                          |                 |
| L17091702-01 RERUN AT 10X. METHANE OVER ICAL.                 |       |      |                          |                 |
| 9   | X     | 10   | Over Calibration Range   | METHANE         |
| File ID: 16G53498   |       |      |                          |                 |
| L17091702-02 RERUN AT 10X. METHANE OVER ICAL.                 |       |      |                          |                 |
| 10  | X     | 20   | Over Calibration Range   | METHANE         |
| File ID: 16G53499   |       |      |                          |                 |
| L17091702-06 RERUN AT 20X. METHANE OVER ICAL.                 |       |      |                          |                 |
| 11  | X     | 5    | Over Calibration Range   | METHANE         |
| File ID: 16G53500   |       |      |                          |                 |
| L17091702-07 RERUN AT 5X. METHANE OVER ICAL                   |       |      |                          |                 |
| 15  | X     | 10   | Over Calibration Range   | METHANE         |
| File ID: 16G53504   |       |      |                          |                 |
| L17091702-10 RERUN AT 10X. METHANE OVER ICAL.                 |       |      |                          |                 |
| 16  | X     | 10   | Over Calibration Range   | METHANE AND CO2 |
| File ID: 16G53505   |       |      |                          |                 |
| L17091719-01 RERUN AT 10X FOR METHANE. CO2 FAILED LOW IN CCV. |       |      |                          |                 |
| 17  | X     | 10   | Over Calibration Range   | METHANE AND CO2 |
| File ID: 16G53506   |       |      |                          |                 |
| L17091719-03 RERUN AT 10X FOR METHANE, CO2 FAILED LOW IN CCV. |       |      |                          |                 |
| 22  | X     | 1    | Carry-over contamination | METHANE AND CO2 |
| File ID: 16G53507   |       |      |                          |                 |
| L17091719-05 RERUN AT 1X FOR C/O                              |       |      |                          |                 |

Approved: October 02, 2017

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## Microbac Laboratories Inc.

## Instrument Run Log

|             |        |           |        |         |
|-------------|--------|-----------|--------|---------|
| Instrument: | HP16   | Dataset:  | 100217 |         |
| Analyst1:   | HRF    | Analyst2: | NA     |         |
| Method:     | RSK175 | SOP:      | RSK01  | Rev: 19 |
| Method:     | 5021   | SOP:      | RSK01  | Rev: 19 |

Maintenance Log ID: \_\_\_\_\_

|                       |                        |                      |
|-----------------------|------------------------|----------------------|
| Internal Standard: NA | Surrogate Standard: NA |                      |
| CCV: STD80684         | LCS: STD81961          | MS/MSD: NA           |
| Column 1 ID: RTQBOND  |                        | Column 2 ID: RTQBOND |
| Workgroups: WG632131  |                        |                      |

Comments: \_\_\_\_\_

| File ID  | Sample Information                 | pH | Mat | Dil | Reference | Date/Time      |
|----------|------------------------------------|----|-----|-----|-----------|----------------|
| 16G53512 | WG632130-01 133umol/mol CCV RSK175 | NA | 1   | 1   | STD80684  | 10/02/17 12:55 |
| 16G53513 | WG632131-01 BLANK RSK175           | NA | 1   | 1   |           | 10/02/17 13:11 |
| 16G53514 | WG632131-02 67umol/mol LCS RSK175  | NA | 1   | 1   | STD81961  | 10/02/17 13:49 |
| 16G53515 | WG632131-03 67umol/mol LCS2 RSK175 | NA | 1   | 1   | STD81961  | 10/02/17 14:01 |
| 16G53517 | L17091719-01 B 10X RSK175          | 6  | 1   | 10  |           | 10/02/17 14:24 |
| 16G53518 | L17091719-03 B 10X RSK175          | 5  | 1   | 10  |           | 10/02/17 14:36 |
| 16G53519 | L17091752-01 A RSK175              | 7  | 1   | 1   |           | 10/02/17 14:47 |
| 16G53520 | L17091752-02 A RSK175              | <2 | 1   | 1   |           | 10/02/17 14:59 |
| 16G53521 | L17091752-03 A RSK175              | <2 | 1   | 1   |           | 10/02/17 15:10 |
| 16G53522 | WG632131-02 67umol/mol LCS RSK175  | NA | 1   | 1   | STD81961  | 10/02/17 15:22 |
| 16G53523 | WG632130-02 133umol/mol CCV RSK175 | NA | 1   | 1   | STD80684  | 10/02/17 15:34 |
| 16G53524 | L17091752-04 A RSK175              | <2 | 1   | 1   |           | 10/02/17 16:03 |
| 16G53525 | L17091752-05 A RSK175              | <2 | 1   | 1   |           | 10/02/17 16:14 |
| 16G53526 | L17091752-06 A RSK175              | 7  | 1   | 1   |           | 10/02/17 16:26 |
| 16G53527 | L17091752-07 A RSK175              | <2 | 1   | 1   |           | 10/02/17 16:38 |
| 16G53528 | L17091702-01 B 10X RSK175          | <2 | 1   | 10  |           | 10/02/17 16:49 |
| 16G53529 | L17091702-02 B 10X RSK175          | <2 | 1   | 10  |           | 10/02/17 17:01 |
| 16G53530 | L17091702-06 B 20X RSK175          | <2 | 1   | 20  |           | 10/02/17 17:13 |
| 16G53531 | L17091702-07 B 5X RSK175           | <2 | 1   | 5   |           | 10/02/17 17:25 |
| 16G53532 | L17091702-10 B 10X RSK175          | <2 | 1   | 10  |           | 10/02/17 17:36 |
| 16G53533 | L17091755-01 A RSK175              | <2 | 1   | 1   |           | 10/02/17 17:48 |
| 16G53534 | WG632130-03 133umol/mol CCV RSK175 | NA | 1   | 1   | STD80684  | 10/02/17 18:00 |

Comments

| Seq.   | Rerun | Dil. | Reason                 | Analytes |
|--|-------|------|------------------------|----------|
| 3  | X     | 1    | LCS failure            | METHANE  |
| File ID: 16G53514                            |       |      |                        |          |
| 8  | X     | 10   | Over Calibration Range | METHANE  |
| File ID: 16G53520                            |       |      |                        |          |
| L17091752-02 METHANE OVER ICAL. RERUN AT 10X |       |      |                        |          |
| 9  | X     | 10   | Over Calibration Range | METHANE  |
| File ID: 16G53521                            |       |      |                        |          |
| L17091752-03 METHANE OVER ICAL RERUN AT 10X  |       |      |                        |          |

Approved: October 04, 2017

*Sarah Vandenberg*

Page: 1

## Microbac Laboratories Inc.

## Instrument Run Log

|             |        |           |        |
|-------------|--------|-----------|--------|
| Instrument: | HP16   | Dataset:  | 100217 |
| Analyst1:   | HRF    | Analyst2: | NA     |
| Method:     | RSK175 | SOP:      | RSK01  |
| Method:     | 5021   | SOP:      | RSK01  |
|             |        | Rev:      | 19     |
|             |        | Rev:      | 19     |

Maintenance Log ID: \_\_\_\_\_

|                      |          |                      |          |
|----------------------|----------|----------------------|----------|
| Internal Standard:   | NA       | Surrogate Standard:  | NA       |
| CCV:                 | STD80684 | LCS:                 | STD81961 |
| Column 1 ID: RTQBOND |          | Column 2 ID: RTQBOND |          |
| Workgroups: WG632131 |          |                      |          |

Comments: \_\_\_\_\_

Comments

| Seq.   | Rerun | Dil. | Reason                 | Analytes |
|--|-------|------|------------------------|----------|
| 10   | X     |      |                        |          |
| File ID: 16G53522                            |       |      |                        |          |
| WG632131-02 LOW FAILING CO2                  |       |      |                        |          |
| 12   | X     | 20   | Over Calibration Range | METHANE  |
| File ID: 16G53524                            |       |      |                        |          |
| L17091752-04 METHANE OVER ICAL RERUN AT 20X  |       |      |                        |          |
| 13   | X     | 100  | Over Calibration Range | METHANE  |
| File ID: 16G53525                            |       |      |                        |          |
| L17091752-05 METHANE OVER ICAL RERUN AT 100X |       |      |                        |          |
| 14   | X     | 20   | Over Calibration Range | METHANE  |
| File ID: 16G53526                            |       |      |                        |          |
| L17091752-06 METHANE OVER ICAL RERUN AT 20X  |       |      |                        |          |
| 15   | X     | 20   | Over Calibration Range | METHANE  |
| File ID: 16G53527                            |       |      |                        |          |
| L17091752-07 METHANE OVER ICAL RERUN AT 20X  |       |      |                        |          |

Approved: October 04, 2017

*Sarah Vandenberg*

Page: 2

Microbac Laboratories Inc.  
HOLDING TIMES  
EQUIVALENT TO AFCEE FORM 9

Analytical Method: RSK175  
Login Number: L17091702

AAB#: WG631960

| Client ID        | ID | Date Collected | TCLP Date | Time Held | Max Hold | Q | Extract Date | Time Held | Max Hold | Q | Run Date | Time Held | Max Hold | Q |
|------------------|----|----------------|-----------|-----------|----------|---|--------------|-----------|----------|---|----------|-----------|----------|---|
| 0297-PW-092617   | 03 | 09/26/17       |           |           |          |   | 09/29/2017   | 3.1       | 14       |   | 09/29/17 | 3.1       | 14       |   |
| 0297-PW-092617MS | 04 | 09/26/17       |           |           |          |   | 09/29/2017   | 3.1       | 14       |   | 09/29/17 | 3.1       | 14       |   |
| 0297-PW-092617SD | 05 | 09/26/17       |           |           |          |   | 09/29/2017   | 3.1       | 14       |   | 09/29/17 | 3.1       | 14       |   |
| 0300-PW-092717   | 08 | 09/27/17       |           |           |          |   | 09/29/2017   | 2.1       | 14       |   | 09/29/17 | 2.1       | 14       |   |
| 0301-PW-092717   | 09 | 09/27/17       |           |           |          |   | 09/29/2017   | 2.1       | 14       |   | 09/29/17 | 2.1       | 14       |   |

\* = SEE PROJECT QAPP REQUIREMENTS

HOLD\_TIMES - Modified 03/06/2008  
PDF File ID: 5503889  
Report generated 10/03/2017 08:24



Microbac Laboratories Inc.  
HOLDING TIMES  
EQUIVALENT TO AFCEE FORM 9

Analytical Method: RSK175  
Login Number: L17091702

AAB#: WG632131

| Client ID       | ID | Date Collected | TCLP Date | Time Held | Max Hold | Q | Extract Date | Time Held | Max Hold | Q | Run Date | Time Held | Max Hold | Q |
|-----------------|----|----------------|-----------|-----------|----------|---|--------------|-----------|----------|---|----------|-----------|----------|---|
| 0293-PW-092617  | 01 | 09/26/17       |           |           |          |   | 10/02/2017   | 6.1       | 14       |   | 10/02/17 | 6.1       | 14       |   |
| 0293-PW-092617D | 02 | 09/26/17       |           |           |          |   | 10/02/2017   | 6.1       | 14       |   | 10/02/17 | 6.1       | 14       |   |
| 0019-PW-092717  | 06 | 09/27/17       |           |           |          |   | 10/02/2017   | 5.3       | 14       |   | 10/02/17 | 5.3       | 14       |   |
| 0298-PW-092717  | 07 | 09/27/17       |           |           |          |   | 10/02/2017   | 5.2       | 14       |   | 10/02/17 | 5.2       | 14       |   |
| 0305-PW-092717  | 10 | 09/27/17       |           |           |          |   | 10/02/2017   | 5         | 14       |   | 10/02/17 | 5         | 14       |   |

\* = SEE PROJECT QAPP REQUIREMENTS

HOLD\_TIMES - Modified 03/06/2008  
PDF File ID: 5503889  
Report generated 10/03/2017 08:24



## METHOD BLANK SUMMARY

Login Number:L17091702 Work Group:WG631960  
 Blank File ID:16G53491 Blank Sample ID:WG631960-01  
 Prep Date:09/29/17 14:53 Instrument ID:HP16  
 Analyzed Date:09/29/17 14:53 Method:RSK175  
 Analyst:HRF

This Method Blank Applies To The Following Samples:

| Client ID        | Lab Sample ID | Lab File ID | Time Analyzed  | TAG  |
|------------------|---------------|-------------|----------------|------|
| LCS              | WG631960-02   | 16G53492    | 09/29/17 15:12 | 01   |
| 0300-PW-092717   | L17091702-08  | 16G53502    | 09/29/17 17:15 | 01   |
| 0301-PW-092717   | L17091702-09  | 16G53503    | 09/29/17 17:26 | 01   |
| 0297-PW-092617MS | L17091702-04  | 16G53508    | 09/29/17 18:25 | DL01 |
| 0297-PW-092617SD | L17091702-05  | 16G53509    | 09/29/17 18:37 | DL01 |
| 0297-PW-092617   | L17091702-03  | 16G53510    | 09/29/17 18:49 | DL01 |

Report Name: BLANK\_SUMMARY  
 PDF File ID: 5503890  
 Report generated 10/03/2017 08:24



## METHOD BLANK SUMMARY

Login Number:L17091702 Work Group:WG632131  
 Blank File ID:16G53513 Blank Sample ID:WG632131-01  
 Prep Date:10/02/17 13:11 Instrument ID:HP16  
 Analyzed Date:10/02/17 13:11 Method:RSK175  
 Analyst:HRF

This Method Blank Applies To The Following Samples:

| Client ID       | Lab Sample ID | Lab File ID | Time Analyzed  | TAG  |
|-----------------|---------------|-------------|----------------|------|
| LCS2            | WG632131-03   | 16G53515    | 10/02/17 14:01 | 01   |
| LCS             | WG632131-02   | 16G53522    | 10/02/17 15:22 | 01   |
| 0293-PW-092617  | L17091702-01  | 16G53528    | 10/02/17 16:49 | DL01 |
| 0293-PW-092617D | L17091702-02  | 16G53529    | 10/02/17 17:01 | DL01 |
| 0019-PW-092717  | L17091702-06  | 16G53530    | 10/02/17 17:13 | DL01 |
| 0298-PW-092717  | L17091702-07  | 16G53531    | 10/02/17 17:25 | DL01 |
| 0305-PW-092717  | L17091702-10  | 16G53532    | 10/02/17 17:36 | DL01 |

Report Name: BLANK\_SUMMARY  
 PDF File ID: 5503890  
 Report generated 10/03/2017 08:24



Microbac Laboratories Inc.

METHOD BLANK REPORT

Login Number:L17091702 Prep Date:09/29/17 14:53 Sample ID:WG631960-01  
Instrument ID:HP16 Run Date:09/29/17 14:53 Prep Method:5021  
File ID:16G53491 Analyst:HRF Method:RSK175  
Workgroup (AAB#):WG631960 Matrix:Water Units:ug/L  
Contract #: \_\_\_\_\_ Cal ID: HP16-19-JUL-17

| Analytes | MDL  | RL   | Concentration | Dilution | Qualifier |
|----------|------|------|---------------|----------|-----------|
| Methane  | 1.00 | 5.00 | 5.00          | 1        | U         |

MDL Method Detection Limit

RL Reporting/Practical Quantitation Limit

ND Analyte Not detected at or above reporting limit

\* |Analyte concentration| > RL

Report Name:BLANK  
PDF ID: 5503891  
03-OCT-2017 08:24



Microbac Laboratories Inc.  
METHOD BLANK REPORT

Login Number:L17091702 Prep Date:10/02/17 13:11 Sample ID:WG632131-01  
Instrument ID:HP16 Run Date:10/02/17 13:11 Prep Method:5021  
File ID:16G53513 Analyst:HRF Method:RSK175  
Workgroup (AAB#):WG632131 Matrix:Water Units:ug/L  
Contract #: \_\_\_\_\_ Cal ID: HP16-19-JUL-17

| Analytes | MDL  | RL   | Concentration | Dilution | Qualifier |
|----------|------|------|---------------|----------|-----------|
| Methane  | 1.00 | 5.00 | 5.00          | 1        | U         |

MDL      Method Detection Limit  
RL      Reporting/Practical Quantitation Limit  
ND      Analyte Not detected at or above reporting limit  
\*      |Analyte concentration|      >    RL

Report Name:BLANK  
PDF ID: 5503891  
03-OCT-2017 08:24



Microbac Laboratories Inc.  
LABORATORY CONTROL SAMPLE (LCS)

Login Number:L17091702 Run Date:09/29/2017 Sample ID:WG631960-02  
Instrument ID:HP16 Run Time:15:12 Prep Method:5021  
File ID:16G53492 Analyst:HRF Method:RSK175  
Workgroup (AAB#):WG631960 Matrix:Water Units:ug/L  
QC Key:DOWWVO2012 Lot#:STD81961 Cal ID: HP16-19-JUL-17

| Analytes | Expected | Found | % Rec | LCS Limits | Q |
|----------|----------|-------|-------|------------|---|
| Methane  | 119      | 104   | 87.9  | 85 - 115   |   |

LCS - Modified 03/06/2008  
PDF File ID: 5503892  
Report generated: 10/02/2017 09:03



Microbac Laboratories Inc.  
LABORATORY CONTROL SAMPLE (LCS)

Login Number:L17091702 Analyst:HRF Prep Method:5021  
Instrument ID:HP16 Matrix:Water Method:RSK175  
Workgroup (AAB#):WG632131 Units:ug/L  
QC Key:DOWWVO2012 Lot #:STD81961  
Sample ID:WG632131-02 LCS File ID:16G53522 Run Date:10/02/2017 15:22  
Sample ID:WG632131-03 LCS2 File ID:16G53515 Run Date:10/02/2017 14:01

| Analytes | LCS   |       |       | LCS2  |       |       | %RPD | %Rec Limits | RPD Lmt | Q |
|----------|-------|-------|-------|-------|-------|-------|------|-------------|---------|---|
|          | Known | Found | % REC | Known | Found | % REC |      |             |         |   |
| Methane  | 119   | 107   | 89.9  | 119   | 102   | 86.0  | 4.41 | 85 - 115    | 20      |   |

LCS\_LCS2 - Modified 03/06/2008  
PDF File ID: 5506081  
Report generated: 10/03/2017 08:24



Loginnum:L17091702Cal ID: HP16- 19-JUL-17Worknum: WG631960Instrument ID:HP16

Contract #: \_\_\_\_\_

Prep Method:5021Parent ID:L17091702-03File ID:16G53496Method:RSK175Sample ID:L17091702-04 MSFile ID:16G53494Matrix:WaterSample ID:L17091702-05 MSDFile ID:16G53495Dil:1Units:ug/L

| Analyte | Parent | MS Spiked | MS Found | MS %Rec | MSD Spiked | MSD Found | MSD %Rec | %Rec Limits   | RPD Limit | Q |
|---------|--------|-----------|----------|---------|------------|-----------|----------|---------------|-----------|---|
| Methane | 946    | 119       | 1180     | 199     | 119        | 1060      | 97.6     | 10.8 85 - 115 | 20        | * |

\* FAILS %REC LIMIT

# FAILS RPD LIMIT

MS\_MSD - Modified 03/06/2008  
PDF File ID: 5503895  
Report generated 10/02/2017 09:04



Loginnum:L17091702Cal ID: HP16- 19-JUL-17Worknum: WG631960Instrument ID:HP16

Contract #: \_\_\_\_\_

Prep Method:5021Parent ID:L17091702-03File ID:16G53510Method:RSK175Sample ID:L17091702-04 MSFile ID:16G53508Matrix:WaterSample ID:L17091702-05 MSDFile ID:16G53509

Dil:5

Units:ug/L

| Analyte | Parent | MS Spiked | MS Found | MS %Rec | MSD Spiked | MSD Found | MSD %Rec | %Rec %RPD | Limits   | RPD Limit | Q |
|---------|--------|-----------|----------|---------|------------|-----------|----------|-----------|----------|-----------|---|
| Methane | 635    | 594       | 1270     | 107     | 594        | 1270      | 106      | 0.628     | 85 - 115 | 20        |   |

\* FAILS %REC LIMIT

# FAILS RPD LIMIT

MS\_MSD - Modified 03/06/2008  
 PDF File ID: 5503895  
 Report generated 10/02/2017 09:04



## Calibration Table Report

Method: RSNEXT.M

Title: RSK175 HP16 (SOP: OVL RSK01) 071917

Last Calibration: Wed Jul 19 13:10:09 2017

Curve: WG622365

## Calibration Files

|                  | 0.67       | 1.67       | 33.3       | 66.7       | 133        | 333        | 533        | Avg        | %RSD  | Linear |
|------------------|------------|------------|------------|------------|------------|------------|------------|------------|-------|--------|
| Compound         | 16G52893.C | 16G52901.C | 16G52896.C | 16G52896.D | 16G52897.C | 16G52898.D | 16G52899.D |            |       |        |
| T methane        | 404814.134 | 179170.390 | 185752.785 | 186907.089 | 191806.647 | 191118.962 | 223262.000 | 39.889     | 0.999 |        |
| T ethene         | 266195.252 | 286227.170 | 318869.271 | 315554.300 | 333256.863 | 327471.890 | 307932.000 | 8.456      |       |        |
| T acetylene      | 280592.466 | 285709.309 | 336070.215 | 333164.754 | 354071.693 | 348070.500 | 322946.000 | 9.648      |       |        |
| T ethane         | 324174.761 | 279681.343 | 300601.101 | 333467.737 | 330689.412 | 349780.337 | 343991.940 | 323198.000 | 7.690 |        |
| T propane        | 460074.754 | 400329.428 | 443530.965 | 497370.841 | 481122.200 | 516070.457 | 501551.933 | 471436.000 | 8.498 |        |
| T n-butane       | 604696.265 | 528083.755 | 593463.357 | 662647.230 | 633057.068 | 685719.032 | 660473.352 | 624023.000 | 8.585 |        |
| Signal #2        | 0.000      | 0.000      | 0.000      | 0.000      | 0.000      | 0.000      | 0.000      | 0.000      | 0.000 |        |
| T carbon dioxide | 6440.955   | 5959.880   | 6328.306   | 6090.624   | 6380.632   | 6359.162   | 6259.960   | 3.036      |       |        |

Wed Jul 19 13:19:18 2017

Microbac Laboratories Inc.  
ALTERNATE SOURCE CALIBRATION REPORT

Login Number:L17091702 Run Date:07/19/2017 Sample ID:WG622365-08  
Instrument ID:HP16 Run Time:12:06 Method:RSK175  
File ID:16G52902 Analyst:HRF QC Key:DOWWVO2012  
ICal Workgroup:WG622365 Cal ID: HP16 - 19-JUL-17

| Analyte | Expected | Found | Units | RF     | %D   | UCL | Q |
|---------|----------|-------|-------|--------|------|-----|---|
| methane | 228      | 221   | ug/L  | 185000 | 2.80 | 15  |   |

\* Exceeds %D Limit

ALT - Modified 09/06/2007  
Version 1.5 PDF File ID: 5503893  
Report generated 10/03/2017 08:24



Microbac Laboratories Inc.  
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number:L17091702 Run Date:09/29/2017 Sample ID:WG631959-01  
Instrument ID:HP16 Run Time:14:41 Method:RSK175  
File ID:16G53490 Analyst:HRF QC Key:DOWWVO2012  
Workgroup (AAB#):WG631960 Cal ID: HP16 - 19-JUL-17  
Matrix:WATER

| Analyte | Expected | Found | UNITS | RF     | %D   | UCL | Q |
|---------|----------|-------|-------|--------|------|-----|---|
| methane | 228      | 207   | ug/L  | 174000 | 9.32 | 15  |   |

\* Exceeds %D Criteria

CCV - Modified 03/05/2008  
PDF File ID: 5503894  
Report generated 10/03/2017 08:24



Microbac Laboratories Inc.  
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number:L17091702 Run Date:09/29/2017 Sample ID:WG631959-02  
Instrument ID:HP16 Run Time:16:58 Method:RSK175  
File ID:16G53501 Analyst:HRF QC Key:DOWWVO2012  
Workgroup (AAB#):WG631960 Cal ID: HP16 - 19-JUL-17  
Matrix:WATER

| Analyte | Expected | Found | UNITS | RF     | %D   | UCL | Q |
|---------|----------|-------|-------|--------|------|-----|---|
| methane | 228      | 218   | ug/L  | 183000 | 4.15 | 15  |   |

\* Exceeds %D Criteria

CCV - Modified 03/05/2008  
PDF File ID: 5503894  
Report generated 10/03/2017 08:24



Microbac Laboratories Inc.  
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number:L17091702 Run Date:09/29/2017 Sample ID:WG631959-03  
Instrument ID:HP16 Run Time:19:00 Method:RSK175  
File ID:16G53511 Analyst:HRF QC Key:DOWWVO2012  
Workgroup (AAB#):WG631960 Cal ID: HP16 - 19-JUL-17  
Matrix:WATER

| Analyte | Expected | Found | UNITS | RF     | %D   | UCL | Q |
|---------|----------|-------|-------|--------|------|-----|---|
| methane | 228      | 203   | ug/L  | 171000 | 10.8 | 15  |   |

\* Exceeds %D Criteria

CCV - Modified 03/05/2008  
PDF File ID: 5503894  
Report generated 10/03/2017 08:24



Microbac Laboratories Inc.  
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number:L17091702 Run Date:10/02/2017 Sample ID:WG632130-01  
Instrument ID:HP16 Run Time:12:55 Method:RSK175  
File ID:16G53512 Analyst:HRF QC Key:DOWWVO2012  
Workgroup (AAB#):WG632131 Cal ID: HP16 - 19-JUL-17  
Matrix:WATER

| Analyte | Expected | Found | UNITS | RF     | %D   | UCL | Q |
|---------|----------|-------|-------|--------|------|-----|---|
| methane | 228      | 214   | ug/L  | 180000 | 5.94 | 15  |   |

\* Exceeds %D Criteria

CCV - Modified 03/05/2008  
PDF File ID: 5503894  
Report generated 10/03/2017 08:24



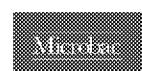
Microbac Laboratories Inc.  
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number:L17091702 Run Date:10/02/2017 Sample ID:WG632130-02  
Instrument ID:HP16 Run Time:15:34 Method:RSK175  
File ID:16G53523 Analyst:HRF QC Key:DOWWVO2012  
Workgroup (AAB#):WG632131 Cal ID: HP16 - 19-JUL-17  
Matrix:WATER

| Analyte | Expected | Found | UNITS | RF     | %D   | UCL | Q |
|---------|----------|-------|-------|--------|------|-----|---|
| methane | 228      | 221   | ug/L  | 185000 | 3.18 | 15  |   |

\* Exceeds %D Criteria

CCV - Modified 03/05/2008  
PDF File ID: 5503894  
Report generated 10/03/2017 08:24



Microbac Laboratories Inc.  
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number:L17091702 Run Date:10/02/2017 Sample ID:WG632130-03  
Instrument ID:HP16 Run Time:18:00 Method:RSK175  
File ID:16G53534 Analyst:HRF QC Key:DOWWVO2012  
Workgroup (AAB#):WG632131 Cal ID: HP16 - 19-JUL-17  
Matrix:WATER

| Analyte | Expected | Found | UNITS | RF     | %D   | UCL | Q |
|---------|----------|-------|-------|--------|------|-----|---|
| methane | 228      | 219   | ug/L  | 184000 | 3.78 | 15  |   |

\* Exceeds %D Criteria

CCV - Modified 03/05/2008  
PDF File ID: 5503894  
Report generated 10/03/2017 08:24



# **3.0 Attachments**

Microbac Laboratories Inc.  
Ohio Valley Division Analyst List  
November 2, 2017

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|                                  |  |
|----------------------------------|--|
| 001 - BIO-CHEM TESTING WVDEP 220 | 002 - REIC Consultants, Inc. WVDEP 060 |
| 003 - Sturm Environmental        | 004 - MICROBAC PITTSBURGH              |
| 005 - ES LABORATORIES            | 006 - ALCOSAN LABORATORIES             |
| 007 - ALS LABORATORIES           | 008 - BENCHMARK LABORATORIES           |
| 010 - MICROBAC CHICAGOLAND       | AC - AMBER R. CARMICHAEL               |
| ADC - ANTHONY D. CANTER          | ADG - APRIL D. GREENE                  |
| ALS - ADRIANE L. STEED           | AWE - ANDREW W. ESSIG                  |
| AZH - AFTER HOURS                | BJO - BRIAN J. OGDEN                   |
| BLG - BRENDA L. GREENWALT        | BLR - BRANDON L. RICHARDS              |
| BNB - Brandi N. Bentley          | BRG - BRENDA R. GREGORY                |
| CAS - Craig A. Smith             | CEB - CHAD E. BARNES                   |
| CLC - CHRYS L. CRAWFORD          | CLG - CARA L. GREENWOOD                |
| CLS - CARA L. STRICKLER          | CPD - CHAD P. DAVIS                    |
| CSH - CHRIS S. HILL              | CV - Carl Volkman                      |
| DAK - DEAN A. KETELSEN           | DCM - DAVID C. MERCKLE                 |
| DEV - DAVID E. VANDENBERG        | DIH - DEANNA I. HESSON                 |
| DLB - DAVID L. BUMGARNER         | DLP - DOROTHY L. PAYNE                 |
| DSM - DAVID S. MOSSOR            | DTG - DOMINIC T. GEHRET                |
| ECL - ERIC C. LAWSON             | EPT - ETHAN P. TIDD                    |
| ERP - ERIN R. PORTER             | FJB - FRANCES J. BOLDEN                |
| HRF - HEATHER R. FAIRCHILD       | JDH - JUSTIN D. HESSON                 |
| JDS - JARED D. SMITH             | JKP - JACQUELINE K. PARSONS            |
| JLD - JESSICA L. DELONG          | JST - JOSHUA S. TAYLOR                 |
| JTP - JOSHUA T. PEMBERTON        | JWR - JOHN W. RICHARDS                 |
| JWS - JACK W. SHEAVES            | JYH - JI Y. HU                         |
| KAK - KATHY A. KIRBY             | KDD - Katelyn D. Daley                 |
| KEB - KATIE E. BARNES            | KHR - KIM H. RHODES                    |
| KKB - KERRI K. BUCK              | KLC - KELLY L. CARVER                  |
| KRA - KATHY R. ALBERTSON         | KRP - KATHY R. PARSONS                 |
| LJH - Lacey J. Hendershot        | LLS - LARRY L. STEPHENS                |
| LSB - LESLIE S. BUCINA           | LSJ - LAURA S. JONES                   |
| MAP - MARLA A. PORTER            | MBK - MORGAN B. KNOWLTON               |
| MES - MARY E. SCHILLING          | MMB - MAREN M. BEERY                   |
| MRT - MICHELLE R. TAYLOR         | OJE - OMOYEMWEN J. ENGLISH             |
| PDM - PIERCE D. MORRIS           | PIT - MICROBAC WARRENDALE              |
| RAF - REBEKAH A. FINN            | REK - BOB E. KYER                      |
| RLB - BOB BUCHANAN               | RNP - RICK N. PETTY                    |
| SAV - SARAH A. VANDENBERG        | SCA - SUEELLEN C. ADAMS                |
| SCB - SARAH C. BOGOLIN           | SCJ - SUE ELLEN C. JOHNSON             |
| SDC - SHALYN D. CONLEY           | TB - TODD BOYLE                        |
| TMB - TIFFANY M. BAILEY          | TMM - TAMMY M. MORRIS                  |
| VC - VICKI COLLIER               | WTD - WADE T. DELONG                   |
| XXX - UNAVAILABLE OR SUBCONTRACT | ZTB - ZACH T. BARNES                   |

## Microbac Laboratories Inc.

## List of Valid Qualifiers

November 02, 2017

Qualkey: DOWWVO

| <u>Qualifier</u> | <u>Description</u>   |
|------------------|--|
| *                | Surrogate or spike compound out of range   |
| +                | Correlation coefficient for the MSA is less than 0.995   |
| <                | Result is less than the associated numerical value.  |
| >                | Result is greater than the associated numerical value.   |
| >,H1             | Result is greater than the associated numerical value. Sample analysis performed past holding time.  |
| A                | See the report narrative   |
| B                | Analyte present in method blank  |
| B,H1             | Analyte present in method blank. Sample analysis performed past holding time.  |
| B1               | Target analyte detected in method blank at or above the method reporting limit   |
| B3               | Target analyte detected in calibration blank at or above the method reporting limit  |
| B4               | The BOD unseeded dilution water blank exceeded 0.2 mg/L  |
| C                | Confirmed by GC/MS   |
| CG               | Confluent growth   |
| CT1              | The cooler temperature at receipt exceeded regulatory guidelines for requested testing.  |
| DL               | Surrogate or spike compound was diluted out  |
| E                | Estimated concentration due to interference.   |
| E,CT1            | Estimated results. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.   |
| EDL              | Elevated sample reporting limits, presence of non-target analytes  |
| EMPC             | Estimated Maximum Possible Concentration   |
| F, S             | Estimated result below quantitation limit; method of standard additions(MSA)   |
| F,CT1            | Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.   |
| FL               | Free Liquid  |
| FP1              | Did not ignite.  |
| H1               | Sample analysis performed past holding time.   |
| H1,CT1           | Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.                           |
| I                | Semiquantitative result (out of instrument calibration range)  |
| J                | Estimated concentration.   |
| J                | The analyte was positively identified, but the quantitation was below the RL.  |
| J,B              | Analyte detected in both the method blank and sample above the MDL.  |
| J,CT1            | Estimated value; the analyte concentration was less than the RL/LOQ.   |
| J,CT1            | Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.   |
| J,P              | Estimate; columns don't agree to within 40%  |
| J,S              | Estimated concentration; analyzed by method of standard addition (MSA)   |
| L                | Sample reporting limits elevated due to matrix interference  |
| L1               | The associated blank spike (LCS) recovery was above the laboratory acceptance limits.  |
| L2               | The associated blank spike (LCS) recovery was below the laboratory acceptance limits.  |
| M                | Matrix effect; the concentration is an estimate due to matrix effect.  |
| N                | Tentatively identified compound(TIC)   |
| NA               | Not applicable   |
| ND               | Not detected at or above the reporting limit (RL)  |
| ND, B            | Not detected at or above the reporting limit (RL). Analyte present in method blank.  |
| ND, CT1          | Analyte was not detected. The concentration is below the reported LOD. The cooler temperature at receipt exceeded regulatory guidelines for requested testing. |
| ND, L            | Not detected; sample reporting limit (RL) elevated due to interference   |
| ND, S            | Not detected; analyzed by method of standard addition (MSA)  |
| ND,H1            | Not detected; Sample analysis performed past holding time.   |
| ND,H1,CT1        | Not detected; Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.             |
| NF               | Not found by library search  |
| NFL              | No free liquid   |
| NI               | Non-ignitable  |
| NR               | Analyte is not required to be analyzed   |
| NS               | Not spiked   |
| P                | Concentrations >40% difference between the two GC columns  |
| Q                | One or more quality control criteria failed. See narrative.  |
| QNS              | Quantity of sample not sufficient to perform analysis  |
| RA               | Reanalysis confirms reported results   |
| RE               | Reanalysis confirms sample matrix interference   |
| S                | Analyzed by method of standard addition (MSA)  |
| SMI              | Sample matrix interference on surrogate  |
| SP               | Reported results are for spike compounds only  |
| TIC              | Tentatively Identified Compound  |
| TNTC             | Too numerous to count  |
| TNTC, B          | Too numerous to count. Analyte present in method blank.  |
| TNTC,CT1         | Too numerous to count. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.   |
| TNTC,H1          | Too numerous to count. Sample analysis performed past holding time.  |
| U                | Not detected at or above the reporting limit (RL).   |
| UJ               | Undetected; the MDL and RL are estimated due to quality control discrepancies.   |
| UQ               | Undetected; the analyte was analyzed for, but not detected.  |



Microbac Laboratories Inc.

List of Valid Qualifiers

November 02, 2017

Qualkey: DOWWVO

W  
X  
X, S  
Z

Post-digestion spike for furnace AA out of control limits  
Exceeds regulatory limit  
Exceeds regulatory limit; method of standard additions (MSA)  
Cannot be resolved from isomer - see below



COC No. A 55419

158 Starlite Drive  
Marietta, OH 45750



**MICROBAC®**

Phone: 740-373-4071

Toll Free: 800-373-4071

\*Water (W), Soil (S), Solid Waste (SD), Unknown (X)

Page 1 of 2

Scanned with CamScanner

Buy COBO STRICKLER

22100010673

|      |      |                             |
|------|------|-----------------------------|
| Date | Time | Received by:<br>(Signature) |
|------|------|-----------------------------|

**Remarks:**



**MICROBAC®**

**COOLER TEMP >6° C LOG**

Cooler ID b732

pH Lot # N/A

Document Control # 1957  
Last 10-07-2016

Issued to: Document Master File

**Microbac Laboratories Inc.**

Internal Chain of Custody Report

Login: L17091702

Account: 2736

Project: 2736.134

Samples: 11

Due Date: 09-OCT-2017

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u> |
|---------------------|---------------------|-----------------|
| L17091702-01        | 973247              |                 |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u>    |
|---------------------|---------------------|--------------------|
| L17091702-01        | 973248              | 826-SPE RSK175-SPE |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
 A2 - Sample Archive (AMBIENT)  
 F1 - Volatiles Freezer in Login  
 V1 - Volatiles Refrigerator in Login  
 W1 - Walkin Cooler in Login



**Microbac Laboratories Inc.**

Internal Chain of Custody Report

Login: L17091702

Account: 2736

Project: 2736.134

Samples: 11

Due Date: 09-OCT-2017

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u> |
|---------------------|---------------------|-----------------|
| L17091702-02        | 973249              |                 |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u>    |
|---------------------|---------------------|--------------------|
| L17091702-02        | 973250              | 826-SPE RSK175-SPE |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
 A2 - Sample Archive (AMBIENT)  
 F1 - Volatiles Freezer in Login  
 V1 - Volatiles Refrigerator in Login  
 W1 - Walkin Cooler in Login



**Microbac Laboratories Inc.**

Internal Chain of Custody Report

Login: L17091702

Account: 2736

Project: 2736.134

Samples: 11

Due Date: 09-OCT-2017

| <u>Samplenum</u> | <u>Container ID</u> | <u>Products</u> |
|------------------|---------------------|-----------------|
| L17091702-03     | 973251              |                 |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

| <u>Samplenum</u> | <u>Container ID</u> | <u>Products</u>    |
|------------------|---------------------|--------------------|
| L17091702-03     | 973252              | 826-SPE RSK175-SPE |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
 A2 - Sample Archive (AMBIENT)  
 F1 - Volatiles Freezer in Login  
 V1 - Volatiles Refrigerator in Login  
 W1 - Walkin Cooler in Login



**Microbac Laboratories Inc.**

Internal Chain of Custody Report

**Login:** L17091702**Account:** 2736**Project:** 2736.134**Samples:** 11**Due Date:** 09-OCT-2017

| <u>Samplenum</u> | <u>Container ID</u> | <u>Products</u> |
|------------------|---------------------|-----------------|
| L17091702-04     | 973253              |                 |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments:Products cancelled.

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments:Products cancelled.

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments:Products cancelled.

| <u>Samplenum</u> | <u>Container ID</u> | <u>Products</u>    |
|------------------|---------------------|--------------------|
| L17091702-04     | 973254              | 826-SPE RSK175-SPE |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
 A2 - Sample Archive (AMBIENT)  
 F1 - Volatiles Freezer in Login  
 V1 - Volatiles Refrigerator in Login  
 W1 - Walkin Cooler in Login



**Microbac Laboratories Inc.**

Internal Chain of Custody Report

Login: L17091702

Account: 2736

Project: 2736.134

Samples: 11

Due Date: 09-OCT-2017

| <u>Samplenum</u> | <u>Container ID</u> | <u>Products</u> |
|------------------|---------------------|-----------------|
| L17091702-05     | 973255              |                 |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

| <u>Samplenum</u> | <u>Container ID</u> | <u>Products</u>    |
|------------------|---------------------|--------------------|
| L17091702-05     | 973256              | 826-SPE RSK175-SPE |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
 A2 - Sample Archive (AMBIENT)  
 F1 - Volatiles Freezer in Login  
 V1 - Volatiles Refrigerator in Login  
 W1 - Walkin Cooler in Login



**Microbac Laboratories Inc.**

Internal Chain of Custody Report

Login: L17091702

Account: 2736

Project: 2736.134

Samples: 11

Due Date: 09-OCT-2017

| <u>Samplenum</u> | <u>Container ID</u> | <u>Products</u> |
|------------------|---------------------|-----------------|
| L17091702-06     | 973257              |                 |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

| <u>Samplenum</u> | <u>Container ID</u> | <u>Products</u>    |
|------------------|---------------------|--------------------|
| L17091702-06     | 973258              | 826-SPE RSK175-SPE |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
 A2 - Sample Archive (AMBIENT)  
 F1 - Volatiles Freezer in Login  
 V1 - Volatiles Refrigerator in Login  
 W1 - Walkin Cooler in Login



**Microbac Laboratories Inc.**

Internal Chain of Custody Report

Login: L17091702

Account: 2736

Project: 2736.134

Samples: 11

Due Date: 09-OCT-2017

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u> |
|---------------------|---------------------|-----------------|
| L17091702-07        | 973259              |                 |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u>    |
|---------------------|---------------------|--------------------|
| L17091702-07        | 973260              | 826-SPE RSK175-SPE |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
 A2 - Sample Archive (AMBIENT)  
 F1 - Volatiles Freezer in Login  
 V1 - Volatiles Refrigerator in Login  
 W1 - Walkin Cooler in Login



**Microbac Laboratories Inc.**

Internal Chain of Custody Report

Login: L17091702

Account: 2736

Project: 2736.134

Samples: 11

Due Date: 09-OCT-2017

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u> |
|---------------------|---------------------|-----------------|
| L17091702-08        | 973261              |                 |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u>    |
|---------------------|---------------------|--------------------|
| L17091702-08        | 973262              | RSK175-SPE 826-SPE |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
 A2 - Sample Archive (AMBIENT)  
 F1 - Volatiles Freezer in Login  
 V1 - Volatiles Refrigerator in Login  
 W1 - Walkin Cooler in Login



**Microbac Laboratories Inc.**

Internal Chain of Custody Report

Login: L17091702

Account: 2736

Project: 2736.134

Samples: 11

Due Date: 09-OCT-2017

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u> |
|---------------------|---------------------|-----------------|
| L17091702-09        | 973263              |                 |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:52 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:52 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:52 | HRF    | CLS        |    |

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u>    |
|---------------------|---------------------|--------------------|
| L17091702-09        | 973264              | 826-SPE RSK175-SPE |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
 A2 - Sample Archive (AMBIENT)  
 F1 - Volatiles Freezer in Login  
 V1 - Volatiles Refrigerator in Login  
 W1 - Walkin Cooler in Login



**Microbac Laboratories Inc.**

Internal Chain of Custody Report

Login: L17091702

Account: 2736

Project: 2736.134

Samples: 11

Due Date: 09-OCT-2017

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u> |
|---------------------|---------------------|-----------------|
| L17091702-10        | 973265              |                 |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:51 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Comments: Products cancelled.

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u>    |
|---------------------|---------------------|--------------------|
| L17091702-10        | 973266              | 826-SPE RSK175-SPE |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 29-SEP-2017 11:50 | HRF    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 11-OCT-2017 07:27 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
 A2 - Sample Archive (AMBIENT)  
 F1 - Volatiles Freezer in Login  
 V1 - Volatiles Refrigerator in Login  
 W1 - Walkin Cooler in Login



**Microbac Laboratories Inc.**

Internal Chain of Custody Report

**Login:** L17091702**Account:** 2736**Project:** 2736.134**Samples:** 11**Due Date:** 09-OCT-2017

| <u>Samplenum</u> | <u>Container ID</u> | <u>Products</u> |
|------------------|---------------------|-----------------|
| L17091702-11     | 973267              | 826-SPE         |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:52 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 29-SEP-2017 10:08 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 29-SEP-2017 11:52 | HRF    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 12-OCT-2017 07:23 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
A2 - Sample Archive (AMBIENT)  
F1 - Volatiles Freezer in Login  
V1 - Volatiles Refrigerator in Login  
W1 - Walkin Cooler in Login



# Microbac

Laboratory Report Number: L17100037 (Revised)

Revised report to change the Sample IDs to EB01-092817 should be INS-EB01-092817 TB01-092817 should be INS-TB01-092817

Shane Lowe  
CH2MHILL, Inc  
1034 South Brentwood Blvd, Suite 2300  
Richmond Heights, MO 63117

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac's Ohio Valley Division (OVD). If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed below.

Laboratory Contact:  
Michelle Taylor – Client Services Specialist  
(740) 373-4071  
[Michelle.Taylor@microbac.com](mailto:Michelle.Taylor@microbac.com)

*I certify that all test results meet all of the requirements of the accrediting authority listed below. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories. The reported results are related only to the samples analyzed as received.*

This report was certified on November 02 2017



Leslie Bucina – Managing Director

State of Origin: WV  
Accrediting Authority: Department of Environmental Protection ID:361  
QAPP: Dow WVO QAPP - 2012 Update



Microbac Laboratories \* Ohio Valley Division  
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## Record of Sample Receipt and Inspection

**Comments/Discrepancies**

This is the record of the shipment conditions and the inspection records for the samples received and reported as a sample delivery group (SDG). All of the samples were inspected and observed to conform to our receipt policies, except as noted below.

The following discrepancies were noted:

| Discrepancy  | Resolution          |
|--|---------------------|
| Sample ID: TB01-092817. 1 of 2 voa vials received w/headspace. BRG | Please proceed> MRT |

**Coolers**

| Cooler # | Temperature Gun | Temperature | COC # | Airbill # | Temp Required? |
|----------|-----------------|-------------|-------|-----------|----------------|
| 00115344 | I               | 5.0         |       |           | X              |

**Inspection Checklist**

| #  | Question   | Result |
|----|--|--------|
| 1  | Were shipping coolers sealed?                              | Yes    |
| 2  | Were custody seals intact?                                 | Yes    |
| 3  | Were cooler temperatures in range of 0-6?                  | Yes    |
| 4  | Was ice present?   | Yes    |
| 5  | Were COC's received/information complete/signed and dated? | Yes    |
| 6  | Were sample containers intact and match COC?               | Yes    |
| 7  | Were sample labels intact and match COC?                   | Yes    |
| 8  | Were the correct containers and volumes received?          | Yes    |
| 9  | Were samples received within EPA hold times?               | Yes    |
| 10 | Were correct preservatives used? (water only)              | Yes    |
| 11 | Were pH ranges acceptable? (voa's excluded)                | NA     |
| 12 | Were VOA samples free of headspace (less than 6mm)?        | No     |



Lab Report #: L17100037

Lab Project #: 2736.134

Project Name: SC-Institute Area 3

Lab Contact: Michelle Taylor

**Samples Received**

| Client ID       | Laboratory ID | Date Collected   | Date Received    |
|-----------------|---------------|------------------|------------------|
| INS-EB01-092817 | L17100037-01  | 09/28/2017 08:20 | 09/29/2017 11:20 |
| 0306-PW-092817  | L17100037-02  | 09/28/2017 11:50 | 09/29/2017 11:20 |
| 0315-PW-092817  | L17100037-03  | 09/28/2017 13:00 | 09/29/2017 11:20 |
| 0309-PW-092817  | L17100037-04  | 09/28/2017 14:25 | 09/29/2017 11:20 |
| 0310-PW-092817  | L17100037-05  | 09/28/2017 15:50 | 09/29/2017 11:20 |
| 0311-PW-092817  | L17100037-06  | 09/28/2017 17:40 | 09/29/2017 11:20 |
| INS-TB01-092817 | L17100037-07  | 09/28/2017 18:00 | 09/29/2017 11:20 |

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**Login Number:** L17100037

**Department:** Volatiles

**Analyst:** Jared Smith

## METHOD

**Preparation** SW-846 5030B/5030C/5035A

**Analysis** SW-846 8260B

## HOLDING TIMES

**Sample Preparation:** All holding times were met.

**Sample Analysis:** All holding times were met.

## PREPARATION

Sample preparation proceeded normally.

## CALIBRATION

**Initial Calibration:** For all compounds that yielded a %RSD greater than 15%, linear or higher order equations were applied. All acceptance criteria were met.

**Alternate Source Standards:** All acceptance criteria were met.

**Continuing Calibration and Tune:** All acceptance criteria were met.

## BATCH QA/QC

**Method Blank:** All acceptance criteria were met.

**Laboratory Control Sample:** All acceptance criteria were met.

**Matrix Spikes:** The MS/MSD results were not associated with this sample delivery group (SDG), due to insufficient volume of sample. The laboratory included an LCS and LCS duplicate in the preparation batch in lieu of the NELAC prescribed MS/MSD. Microbac Laboratories recommends site specific MS/MSD samples to avoid possible data qualifications.

## SAMPLES

**Internal Standards:** All acceptance criteria were met.

**Surrogates:** All acceptance criteria were met.

**Other:** None.

## Manual Integration Reason Codes

**Reason #1: Data System Fails to Select Correct Peak.** In some cases the chromatography system selects and integrates the 'wrong peak'. In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

**Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak.** This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low areacounts for the target compound.

**Reason #3: Improperly Integrated Isomers and/or coeluting compounds.** This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

**Reason #4: System Establishes Incorrect Baseline.** There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and should be corrected via manual procedures.

**Reason #5: Miscellaneous.** Other situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the laboratory management. If the form of manual integration is not clearly covered by these four cases, then review and approval by the Managing Director or the QAO will be required.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

**Narrative ID:** 130297

**Approved By:** Anthony Canter





**Login Number:** L17100037  
**Department:** Volatiles - GC  
**Analyst:** Heather Fairchild

## Analysis RSK-175

### HOLDING TIMES

**Sample Preparation:** All holding times were met.

**Sample Analysis:** All holding times were met.

### PREPARATION

Sample preparation proceeded normally.

### CALIBRATION

**Initial Calibration:** For all compounds that yielded a %RSD greater than 15%, linear or higher order equations were applied. All acceptance criteria were met.

**Alternate Source Standards:** All acceptance criteria were met.

**Continuing Calibration and Tune:** All acceptance criteria were met.

### BATCH QA/QC

**Method Blank:** All acceptance criteria were met.

**Laboratory Control Sample:** All acceptance criteria were met.

**Matrix Spikes/Sample Duplicates:** The MS/MSD results were not associated with this sample delivery group (SDG), due to insufficient volume of sample. Microbac Laboratories recommends site specific MS/MSD samples to avoid possible data qualifications.

### SAMPLES

**Samples:** Samples 04, and 06 required dilution analyses.

### **Manual Integration Reason Codes**

**Reason #1: Data System Fails to Select Correct Peak** In some cases the chromatography system selects and integrates the 'wrong peak'. In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

**Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak** This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low area counts for the target compound.

**Reason #3: Improperly Integrated Isomers and/or coeluting compounds.** This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

**Reason #4: System Establishes Incorrect Baseline** There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and should be corrected via manual procedures.

**Reason #5: Miscellaneous** Other situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the laboratory management. If the form of manual integration is not clearly covered by these four cases, then review and approval by the Laboratory Director or the QA/QC Supervisor will be required.

**Narrative ID:** 130247

**Approved By:** Anthony Canter



## Certificate of Analysis

Sample #: L17100037-01

PrePrep Method: N/A

Instrument: HPMS11

Client ID: INS-EB01-092817

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 10/02/2017 23:16

Workgroup #: WG632950

Analyst: JDS

Run Date: 10/06/2017 16:29

Collect Date: 09/28/2017 08:20

Dilution: 1

File ID: 11M22056

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        | U    | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 |        | U    | 1.00 | 0.125 |
| Chloroform                | 67-66-3  |        | U    | 1.00 | 0.125 |
| Dibromochloromethane      | 124-48-1 |        | U    | 1.00 | 0.250 |
| Dichlorodifluoromethane   | 75-71-8  |        | U    | 1.00 | 0.250 |
| Chloromethane             | 74-87-3  |        | U    | 1.00 | 0.500 |
| cis-1,2-Dichloroethene    | 156-59-2 |        | U    | 1.00 | 0.250 |
| Diethyl ether             | 60-29-7  |        | U    | 10.0 | 5.00  |
| Ethylbenzene              | 100-41-4 |        | U    | 1.00 | 0.250 |
| Methylene chloride        | 75-09-2  |        | U    | 1.00 | 0.250 |
| Naphthalene               | 91-20-3  |        | U    | 1.00 | 0.200 |
| Styrene                   | 100-42-5 |        | U    | 1.00 | 0.125 |
| Tetrachloroethene         | 127-18-4 |        | U    | 1.00 | 0.250 |
| Toluene                   | 108-88-3 |        | U    | 1.00 | 0.250 |
| trans-1,2-Dichloroethene  | 156-60-5 |        | U    | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                | CAS #  | Result      | Qual        | RL   | MDL   |
|------------------------|--|-------------|-------------|------|-------|
| Trichloroethene        | 79-01-6  |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4  |             | U           | 1.00 | 0.250 |
| Vinyl chloride         | 75-01-4  |             | U           | 1.00 | 0.250 |
| Xylenes                | 1330-20-7  |             | U           | 1.00 | 0.500 |
| Surrogate              | Recovery   | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4  | 91.2   | 70          | 120         |      |       |
| 4-Bromofluorobenzene   | 103  | 75          | 120         |      |       |
| Dibromofluoromethane   | 95.5   | 85          | 115         |      |       |
| Toluene-d8             | 97.5   | 85          | 120         |      |       |
| U                      | Not detected at or above the reporting limit (RL). |             |             |      |       |

Sample #: L17100037-01  
 Client ID: INS-EB01-092817  
 Matrix: Water  
 Workgroup #: WG632225  
 Collect Date: 09/28/2017 08:20  
 Sample Tag: 01

PrePrep Method: N/A  
 Prep Method: 5021  
 Analytical Method: RSK175  
 Analyst: HRF  
 Dilution: 1  
 Units: ug/L

Instrument: HP16  
 Prep Date: N/A  
 Cal Date: 07/19/2017 11:32  
 Run Date: 10/03/2017 10:57  
 File ID: 16G53546

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 12.4   |      | 5.00 | 1.00 |

Sample #: L17100037-02  
 Client ID: 0306-PW-092817  
 Matrix: Water  
 Workgroup #: WG632950  
 Collect Date: 09/28/2017 11:50  
 Sample Tag: 01

PrePrep Method: N/A  
 Prep Method: 5030B/5030C/5035A  
 Analytical Method: 8260B  
 Analyst: JDS  
 Dilution: 1  
 Units: ug/L

Instrument: HPMS11  
 Prep Date: N/A  
 Cal Date: 10/02/2017 23:16  
 Run Date: 10/06/2017 19:54  
 File ID: 11M22063

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |

## Certificate of Analysis

| Analyte                  | CAS #     | Result      | Qual        | RL   | MDL   |
|--------------------------|-----------|-------------|-------------|------|-------|
| 4-Methyl-2-pentanone     | 108-10-1  |             | U           | 5.00 | 2.50  |
| Acetone                  | 67-64-1   |             | U           | 5.00 | 2.50  |
| 2-Hexanone               | 591-78-6  |             | U           | 5.00 | 2.50  |
| Benzene                  | 71-43-2   |             | U           | 1.00 | 0.125 |
| Bromodichloromethane     | 75-27-4   |             | U           | 1.00 | 0.250 |
| Bromomethane             | 74-83-9   |             | U           | 1.00 | 0.500 |
| Carbon disulfide         | 75-15-0   |             | U           | 1.00 | 0.500 |
| Carbon tetrachloride     | 56-23-5   |             | U           | 1.00 | 0.250 |
| Chlorobenzene            | 108-90-7  | 2.41        |             | 1.00 | 0.125 |
| Chloroform               | 67-66-3   |             | U           | 1.00 | 0.125 |
| Dibromochloromethane     | 124-48-1  |             | U           | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8   |             | U           | 1.00 | 0.250 |
| Chloromethane            | 74-87-3   |             | U           | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2  |             | U           | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7   | 27.1        |             | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4  |             | U           | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2   |             | U           | 1.00 | 0.250 |
| Naphthalene              | 91-20-3   | 1.16        |             | 1.00 | 0.200 |
| Styrene                  | 100-42-5  |             | U           | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4  |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3  |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5  |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6   |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4   |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4   |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7 |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery  | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 90.4      | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 97.7      | 75          | 120         |      |       |
| Dibromofluoromethane     | 91.5      | 85          | 115         |      |       |
| Toluene-d8               | 94.2      | 85          | 120         |      |       |

U Not detected at or above the reporting limit (RL).

Sample #: L17100037-02

PrePrep Method: N/A

Instrument: HP16

Client ID: 0306-PW-092817

Prep Method: 5021

Prep Date: N/A

Matrix: Water

Analytical Method: RSK175

Cal Date: 07/19/2017 11:32

Workgroup #: WG632225

Analyst: HRF

Run Date: 10/03/2017 11:51

Collect Date: 09/28/2017 11:50

Dilution: 1

File ID: 16G53547

Sample Tag: 01

Units: ug/L

## Certificate of Analysis

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 150    |      | 5.00 | 1.00 |

Sample #: L17100037-03      PrePrep Method: N/A      Instrument: HPMS11  
 Client ID: 0315-PW-092817      Prep Method: 5030B/5030C/5035A      Prep Date: N/A  
 Matrix: Water      Analytical Method: 8260B      Cal Date: 10/02/2017 23:16  
 Workgroup #: WG632950      Analyst: JDS      Run Date: 10/06/2017 20:23  
 Collect Date: 09/28/2017 13:00      Dilution: 1      File ID: 11M22064  
 Sample Tag: 01      Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        | U    | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 |        | U    | 1.00 | 0.125 |
| Chloroform                | 67-66-3  |        | U    | 1.00 | 0.125 |
| Dibromochloromethane      | 124-48-1 |        | U    | 1.00 | 0.250 |
| Dichlorodifluoromethane   | 75-71-8  |        | U    | 1.00 | 0.250 |
| Chloromethane             | 74-87-3  |        | U    | 1.00 | 0.500 |
| cis-1,2-Dichloroethene    | 156-59-2 |        | U    | 1.00 | 0.250 |
| Diethyl ether             | 60-29-7  | 64.0   |      | 10.0 | 5.00  |
| Ethylbenzene              | 100-41-4 |        | U    | 1.00 | 0.250 |
| Methylene chloride        | 75-09-2  |        | U    | 1.00 | 0.250 |
| Naphthalene               | 91-20-3  |        | U    | 1.00 | 0.200 |
| Styrene                   | 100-42-5 |        | U    | 1.00 | 0.125 |

## Certificate of Analysis

| Analyte                  | CAS #  | Result      | Qual        | RL   | MDL   |
|--------------------------|--|-------------|-------------|------|-------|
| Tetrachloroethene        | 127-18-4   |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3   |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5   |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6  |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4  |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4  |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7  |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery   | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 89.8   | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 103  | 75          | 120         |      |       |
| Dibromofluoromethane     | 94.0   | 85          | 115         |      |       |
| Toluene-d8               | 94.2   | 85          | 120         |      |       |
| U                        | Not detected at or above the reporting limit (RL). |             |             |      |       |

Sample #: L17100037-03

PrePrep Method: N/A

Instrument: HP16

Client ID: 0315-PW-092817

Prep Method: 5021

Prep Date: N/A

Matrix: Water

Analytical Method: RSK175

Cal Date: 07/19/2017 11:32

Workgroup #: WG632225

Analyst: HRF

Run Date: 10/03/2017 12:02

Collect Date: 09/28/2017 13:00

Dilution: 1

File ID: 16G53548

Sample Tag: 01

Units: ug/L

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 505    |      | 5.00 | 1.00 |

Sample #: L17100037-04

PrePrep Method: N/A

Instrument: HPMS11

Client ID: 0309-PW-092817

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 10/02/2017 23:16

Workgroup #: WG632950

Analyst: JDS

Run Date: 10/06/2017 20:52

Collect Date: 09/28/2017 14:25

Dilution: 1

File ID: 11M22065

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |

## Certificate of Analysis

| Analyte                  | CAS #     | Result | Qual | RL   | MDL   |
|--------------------------|-----------|--------|------|------|-------|
| 1,3,5-Trimethylbenzene   | 108-67-8  |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene      | 541-73-1  |        | U    | 1.00 | 0.250 |
| 2-Butanone               | 78-93-3   |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone     | 108-10-1  |        | U    | 5.00 | 2.50  |
| Acetone                  | 67-64-1   |        | U    | 5.00 | 2.50  |
| 2-Hexanone               | 591-78-6  |        | U    | 5.00 | 2.50  |
| Benzene                  | 71-43-2   |        | U    | 1.00 | 0.125 |
| Bromodichloromethane     | 75-27-4   |        | U    | 1.00 | 0.250 |
| Bromomethane             | 74-83-9   |        | U    | 1.00 | 0.500 |
| Carbon disulfide         | 75-15-0   |        | U    | 1.00 | 0.500 |
| Carbon tetrachloride     | 56-23-5   |        | U    | 1.00 | 0.250 |
| Chlorobenzene            | 108-90-7  |        | U    | 1.00 | 0.125 |
| Chloroform               | 67-66-3   |        | U    | 1.00 | 0.125 |
| Dibromochloromethane     | 124-48-1  |        | U    | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8   |        | U    | 1.00 | 0.250 |
| Chloromethane            | 74-87-3   |        | U    | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2  |        | U    | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7   | 81.5   |      | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4  |        | U    | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2   |        | U    | 1.00 | 0.250 |
| Naphthalene              | 91-20-3   |        | U    | 1.00 | 0.200 |
| Styrene                  | 100-42-5  |        | U    | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4  |        | U    | 1.00 | 0.250 |
| Toluene                  | 108-88-3  |        | U    | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5  |        | U    | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6   |        | U    | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4   |        | U    | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4   |        | U    | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7 |        | U    | 1.00 | 0.500 |

| Surrogate             | Recovery | Lower Limit | Upper Limit | Q |  |
|-----------------------|----------|-------------|-------------|---|--|
| 1,2-Dichloroethane-d4 | 88.7     | 70          | 120         |   |  |
| 4-Bromofluorobenzene  | 100      | 75          | 120         |   |  |
| Dibromofluoromethane  | 91.0     | 85          | 115         |   |  |
| Toluene-d8            | 94.1     | 85          | 120         |   |  |

|   |  |
|---|--|
| U | Not detected at or above the reporting limit (RL). |
|---|--|

## Certificate of Analysis

Sample #: L17100037-04

PrePrep Method: N/A

Instrument: HP16

Client ID: 0309-PW-092817

Prep Method: 5021

Prep Date: N/A

Matrix: Water

Analytical Method: RSK175

Cal Date: 07/19/2017 11:32

Workgroup #: WG632225

Analyst: HRF

Run Date: 10/03/2017 15:26

Collect Date: 09/28/2017 14:25

Dilution: 5

File ID: 16G53554

Sample Tag: DL01

Units: ug/L

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 980    |      | 25.0 | 5.00 |

Sample #: L17100037-05

PrePrep Method: N/A

Instrument: HPMS11

Client ID: 0310-PW-092817

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 10/02/2017 23:16

Workgroup #: WG632950

Analyst: JDS

Run Date: 10/06/2017 21:22

Collect Date: 09/28/2017 15:50

Dilution: 1

File ID: 11M22066

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        | U    | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 |        | U    | 1.00 | 0.125 |
| Chloroform                | 67-66-3  |        | U    | 1.00 | 0.125 |
| Dibromochloromethane      | 124-48-1 |        | U    | 1.00 | 0.250 |
| Dichlorodifluoromethane   | 75-71-8  |        | U    | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                  | CAS #     | Result      | Qual        | RL   | MDL   |
|--------------------------|-----------|-------------|-------------|------|-------|
| Chloromethane            | 74-87-3   |             | U           | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2  |             | U           | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7   | 16.7        |             | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4  |             | U           | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2   |             | U           | 1.00 | 0.250 |
| Naphthalene              | 91-20-3   |             | U           | 1.00 | 0.200 |
| Styrene                  | 100-42-5  |             | U           | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4  |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3  |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5  |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6   |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4   |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4   |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7 |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery  | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 87.3      | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 98.6      | 75          | 120         |      |       |
| Dibromofluoromethane     | 89.1      | 85          | 115         |      |       |
| Toluene-d8               | 91.9      | 85          | 120         |      |       |

U Not detected at or above the reporting limit (RL).

Sample #: L17100037-05  
 Client ID: 0310-PW-092817  
 Matrix: Water  
 Workgroup #: WG632225  
 Collect Date: 09/28/2017 15:50  
 Sample Tag: 01

PrePrep Method: N/A  
 Prep Method: 5021  
 Analytical Method: RSK175  
 Analyst: HRF  
 Dilution: 1  
 Units: ug/L

Instrument: HP16  
 Prep Date: N/A  
 Cal Date: 07/19/2017 11:32  
 Run Date: 10/03/2017 12:25  
 File ID: 16G53550

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 210    |      | 5.00 | 1.00 |

Sample #: L17100037-06  
 Client ID: 0311-PW-092817  
 Matrix: Water  
 Workgroup #: WG632950  
 Collect Date: 09/28/2017 17:40  
 Sample Tag: 01

PrePrep Method: N/A  
 Prep Method: 5030B/5030C/5035A  
 Analytical Method: 8260B  
 Analyst: JDS  
 Dilution: 1  
 Units: ug/L

Instrument: HPMS11  
 Prep Date: N/A  
 Cal Date: 10/02/2017 23:16  
 Run Date: 10/06/2017 21:52  
 File ID: 11M22067

| Analyte                   | CAS #   | Result | Qual | RL   | MDL   |
|---------------------------|---------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5 |        | U    | 1.00 | 0.200 |

## Certificate of Analysis

| Analyte                  | CAS #     | Result      | Qual        | RL   | MDL   |
|--------------------------|-----------|-------------|-------------|------|-------|
| 1,1,2-Trichloroethane    | 79-00-5   |             | U           | 1.00 | 0.250 |
| 1,1-Dichloroethane       | 75-34-3   |             | U           | 1.00 | 0.125 |
| 1,1-Dichloroethene       | 75-35-4   |             | U           | 1.00 | 0.500 |
| 1,2-Dichloroethane       | 107-06-2  |             | U           | 1.00 | 0.250 |
| 1,2-Dichloropropane      | 78-87-5   |             | U           | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene   | 95-63-6   |             | U           | 1.00 | 0.250 |
| 1,4-Dichlorobenzene      | 106-46-7  |             | U           | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene   | 108-67-8  |             | U           | 1.00 | 0.250 |
| 1,3-Dichlorobenzene      | 541-73-1  |             | U           | 1.00 | 0.250 |
| 2-Butanone               | 78-93-3   |             | U           | 5.00 | 2.50  |
| 4-Methyl-2-pentanone     | 108-10-1  |             | U           | 5.00 | 2.50  |
| Acetone                  | 67-64-1   |             | U           | 5.00 | 2.50  |
| 2-Hexanone               | 591-78-6  |             | U           | 5.00 | 2.50  |
| Benzene                  | 71-43-2   |             | U           | 1.00 | 0.125 |
| Bromodichloromethane     | 75-27-4   |             | U           | 1.00 | 0.250 |
| Bromomethane             | 74-83-9   |             | U           | 1.00 | 0.500 |
| Carbon disulfide         | 75-15-0   |             | U           | 1.00 | 0.500 |
| Carbon tetrachloride     | 56-23-5   |             | U           | 1.00 | 0.250 |
| Chlorobenzene            | 108-90-7  |             | U           | 1.00 | 0.125 |
| Chloroform               | 67-66-3   |             | U           | 1.00 | 0.125 |
| Dibromochloromethane     | 124-48-1  |             | U           | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8   |             | U           | 1.00 | 0.250 |
| Chloromethane            | 74-87-3   |             | U           | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2  |             | U           | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7   | 59.1        |             | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4  |             | U           | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2   |             | U           | 1.00 | 0.250 |
| Naphthalene              | 91-20-3   | 31.4        |             | 1.00 | 0.200 |
| Styrene                  | 100-42-5  |             | U           | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4  |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3  |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5  |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6   |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4   |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4   |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7 |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery  | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 90.9      | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 104       | 75          | 120         |      |       |

## Certificate of Analysis

|                      |      |    |     |  |
|----------------------|------|----|-----|--|
| Dibromofluoromethane | 93.7 | 85 | 115 |  |
| Toluene-d8           | 93.4 | 85 | 120 |  |

|   |  |
|---|--|
| U | Not detected at or above the reporting limit (RL). |
|---|--|

Sample #: L17100037-06  
 Client ID: 0311-PW-092817  
 Matrix: Water  
 Workgroup #: WG632225  
 Collect Date: 09/28/2017 17:40  
 Sample Tag: DL01

PrePrep Method: N/A  
 Prep Method: 5021  
 Analytical Method: RSK175  
 Analyst: HRF  
 Dilution: 5  
 Units: ug/L

Instrument: HP16  
 Prep Date: N/A  
 Cal Date: 07/19/2017 11:32  
 Run Date: 10/03/2017 15:37  
 File ID: 16G53555

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 987    |      | 25.0 | 5.00 |

Sample #: L17100037-07  
 Client ID: INS-TB01-092817  
 Matrix: Water  
 Workgroup #: WG632950  
 Collect Date: 09/28/2017 18:00  
 Sample Tag: 01

PrePrep Method: N/A  
 Prep Method: 5030B/5030C/5035A  
 Analytical Method: 8260B  
 Analyst: JDS  
 Dilution: 1  
 Units: ug/L

Instrument: HPMS11  
 Prep Date: N/A  
 Cal Date: 10/02/2017 23:16  
 Run Date: 10/06/2017 15:01  
 File ID: 11M22053

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        | U    | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                  | CAS #     | Result | Qual | RL   | MDL   |
|--------------------------|-----------|--------|------|------|-------|
| Chlorobenzene            | 108-90-7  |        | U    | 1.00 | 0.125 |
| Chloroform               | 67-66-3   |        | U    | 1.00 | 0.125 |
| Dibromochloromethane     | 124-48-1  |        | U    | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8   |        | U    | 1.00 | 0.250 |
| Chloromethane            | 74-87-3   |        | U    | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2  |        | U    | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7   |        | U    | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4  |        | U    | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2   |        | U    | 1.00 | 0.250 |
| Naphthalene              | 91-20-3   |        | U    | 1.00 | 0.200 |
| Styrene                  | 100-42-5  |        | U    | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4  |        | U    | 1.00 | 0.250 |
| Toluene                  | 108-88-3  |        | U    | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5  |        | U    | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6   |        | U    | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4   |        | U    | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4   |        | U    | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7 |        | U    | 1.00 | 0.500 |

| Surrogate             | Recovery | Lower Limit | Upper Limit | Q |
|-----------------------|----------|-------------|-------------|---|
| 1,2-Dichloroethane-d4 | 88.5     | 70          | 120         |   |
| 4-Bromofluorobenzene  | 102      | 75          | 120         |   |
| Dibromofluoromethane  | 93.9     | 85          | 115         |   |
| Toluene-d8            | 95.5     | 85          | 120         |   |

U      Not detected at or above the reporting limit (RL).

## **2.1 Volatiles Data**

## **2.1.1 Volatiles GCMS Data (8260)**

## **2.1.1.1 Summary Data**



**Login Number:** L17100037

**Department:** Volatiles

**Analyst:** Jared Smith

## METHOD

**Preparation** SW-846 5030B/5030C/5035A

**Analysis** SW-846 8260B

## HOLDING TIMES

**Sample Preparation:** All holding times were met.

**Sample Analysis:** All holding times were met.

## PREPARATION

Sample preparation proceeded normally.

## CALIBRATION

**Initial Calibration:** For all compounds that yielded a %RSD greater than 15%, linear or higher order equations were applied. All acceptance criteria were met.

**Alternate Source Standards:** All acceptance criteria were met.

**Continuing Calibration and Tune:** All acceptance criteria were met.

## BATCH QA/QC

**Method Blank:** All acceptance criteria were met.

**Laboratory Control Sample:** All acceptance criteria were met.

**Matrix Spikes:** The MS/MSD results were not associated with this sample delivery group (SDG), due to insufficient volume of sample. The laboratory included an LCS and LCS duplicate in the preparation batch in lieu of the NELAC prescribed MS/MSD. Microbac Laboratories recommends site specific MS/MSD samples to avoid possible data qualifications.

## SAMPLES

**Internal Standards:** All acceptance criteria were met.

**Surrogates:** All acceptance criteria were met.

**Other:** None.

## Manual Integration Reason Codes

**Reason #1: Data System Fails to Select Correct Peak.** In some cases the chromatography system selects and integrates the 'wrong peak'. In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

**Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak.** This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low areacounts for the target compound.

**Reason #3: Improperly Integrated Isomers and/or coeluting compounds.** This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

**Reason #4: System Establishes Incorrect Baseline.** There are numerous situations in chromatography where the system establishes the baseline incorrectly. Some baseline errors will be obvious to the analyst and should be corrected via manual procedures.

**Reason #5: Miscellaneous.** Other situations involving integration errors may require in-depth review and technical judgment. These cases should be brought to the attention of the laboratory management. If the form of manual integration is not clearly covered by these four cases, then review and approval by the Managing Director or the QAO will be required.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Microbac Laboratories Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

**Narrative ID:** 130297

**Approved By:** Anthony Canter



## Certificate of Analysis

Sample #: L17100037-01

PrePrep Method: N/A

Instrument: HPMS11

Client ID: INS-EB01-092817

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 10/02/2017 23:16

Workgroup #: WG632950

Analyst: JDS

Run Date: 10/06/2017 16:29

Collect Date: 09/28/2017 08:20

Dilution: 1

File ID: 11M22056

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        | U    | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 |        | U    | 1.00 | 0.125 |
| Chloroform                | 67-66-3  |        | U    | 1.00 | 0.125 |
| Dibromochloromethane      | 124-48-1 |        | U    | 1.00 | 0.250 |
| Dichlorodifluoromethane   | 75-71-8  |        | U    | 1.00 | 0.250 |
| Chloromethane             | 74-87-3  |        | U    | 1.00 | 0.500 |
| cis-1,2-Dichloroethene    | 156-59-2 |        | U    | 1.00 | 0.250 |
| Diethyl ether             | 60-29-7  |        | U    | 10.0 | 5.00  |
| Ethylbenzene              | 100-41-4 |        | U    | 1.00 | 0.250 |
| Methylene chloride        | 75-09-2  |        | U    | 1.00 | 0.250 |
| Naphthalene               | 91-20-3  |        | U    | 1.00 | 0.200 |
| Styrene                   | 100-42-5 |        | U    | 1.00 | 0.125 |
| Tetrachloroethene         | 127-18-4 |        | U    | 1.00 | 0.250 |
| Toluene                   | 108-88-3 |        | U    | 1.00 | 0.250 |
| trans-1,2-Dichloroethene  | 156-60-5 |        | U    | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                | CAS #  | Result      |             | Qual | RL   | MDL   |
|------------------------|--|-------------|-------------|------|------|-------|
| Trichloroethene        | 79-01-6  |             |             | U    | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4  |             |             | U    | 1.00 | 0.250 |
| Vinyl chloride         | 75-01-4  |             |             | U    | 1.00 | 0.250 |
| Xylenes                | 1330-20-7  |             |             | U    | 1.00 | 0.500 |
| Surrogate              | Recovery   | Lower Limit | Upper Limit | Q    |      |       |
| 1,2-Dichloroethane-d4  | 91.2   | 70          | 120         |      |      |       |
| 4-Bromofluorobenzene   | 103  | 75          | 120         |      |      |       |
| Dibromofluoromethane   | 95.5   | 85          | 115         |      |      |       |
| Toluene-d8             | 97.5   | 85          | 120         |      |      |       |
| U                      | Not detected at or above the reporting limit (RL). |             |             |      |      |       |

Sample #: L17100037-02

PrePrep Method: N/A

Instrument: HPMS11

Client ID: 0306-PW-092817

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 10/02/2017 23:16

Workgroup #: WG632950

Analyst: JDS

Run Date: 10/06/2017 19:54

Collect Date: 09/28/2017 11:50

Dilution: 1

File ID: 11M22063

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result |  | Qual | RL   | MDL   |
|---------------------------|----------|--------|--|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        |  | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        |  | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        |  | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        |  | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        |  | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        |  | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        |  | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        |  | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        |  | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        |  | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        |  | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        |  | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        |  | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        |  | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        |  | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        |  | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        |  | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        |  | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        |  | U    | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 | 2.41   |  |      | 1.00 | 0.125 |
| Chloroform                | 67-66-3  |        |  | U    | 1.00 | 0.125 |

## Certificate of Analysis

| Analyte                  | CAS #  | Result      | Qual        | RL   | MDL   |
|--------------------------|--|-------------|-------------|------|-------|
| Dibromochloromethane     | 124-48-1   |             | U           | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8  |             | U           | 1.00 | 0.250 |
| Chloromethane            | 74-87-3  |             | U           | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2   |             | U           | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7  | 27.1        |             | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4   |             | U           | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2  |             | U           | 1.00 | 0.250 |
| Naphthalene              | 91-20-3  | 1.16        |             | 1.00 | 0.200 |
| Styrene                  | 100-42-5   |             | U           | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4   |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3   |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5   |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6  |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4  |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4  |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7  |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery   | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 90.4   | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 97.7   | 75          | 120         |      |       |
| Dibromofluoromethane     | 91.5   | 85          | 115         |      |       |
| Toluene-d8               | 94.2   | 85          | 120         |      |       |
| U                        | Not detected at or above the reporting limit (RL). |             |             |      |       |

Sample #: L17100037-03

PrePrep Method: N/A

Instrument: HPMS11

Client ID: 0315-PW-092817

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 10/02/2017 23:16

Workgroup #: WG632950

Analyst: JDS

Run Date: 10/06/2017 20:23

Collect Date: 09/28/2017 13:00

Dilution: 1

File ID: 11M22064

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                  | CAS #  | Result      | Qual        | RL   | MDL   |
|--------------------------|--|-------------|-------------|------|-------|
| 1,3-Dichlorobenzene      | 541-73-1   |             | U           | 1.00 | 0.250 |
| 2-Butanone               | 78-93-3  |             | U           | 5.00 | 2.50  |
| 4-Methyl-2-pentanone     | 108-10-1   |             | U           | 5.00 | 2.50  |
| Acetone                  | 67-64-1  |             | U           | 5.00 | 2.50  |
| 2-Hexanone               | 591-78-6   |             | U           | 5.00 | 2.50  |
| Benzene                  | 71-43-2  |             | U           | 1.00 | 0.125 |
| Bromodichloromethane     | 75-27-4  |             | U           | 1.00 | 0.250 |
| Bromomethane             | 74-83-9  |             | U           | 1.00 | 0.500 |
| Carbon disulfide         | 75-15-0  |             | U           | 1.00 | 0.500 |
| Carbon tetrachloride     | 56-23-5  |             | U           | 1.00 | 0.250 |
| Chlorobenzene            | 108-90-7   |             | U           | 1.00 | 0.125 |
| Chloroform               | 67-66-3  |             | U           | 1.00 | 0.125 |
| Dibromochloromethane     | 124-48-1   |             | U           | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8  |             | U           | 1.00 | 0.250 |
| Chloromethane            | 74-87-3  |             | U           | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2   |             | U           | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7  | 64.0        |             | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4   |             | U           | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2  |             | U           | 1.00 | 0.250 |
| Naphthalene              | 91-20-3  |             | U           | 1.00 | 0.200 |
| Styrene                  | 100-42-5   |             | U           | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4   |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3   |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5   |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6  |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4  |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4  |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7  |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery   | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 89.8   | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 103  | 75          | 120         |      |       |
| Dibromofluoromethane     | 94.0   | 85          | 115         |      |       |
| Toluene-d8               | 94.2   | 85          | 120         |      |       |
| U                        | Not detected at or above the reporting limit (RL). |             |             |      |       |

## Certificate of Analysis

|               |                  |                    |                   |             |                  |
|---------------|------------------|--------------------|-------------------|-------------|------------------|
| Sample #:     | L17100037-04     | PrePrep Method:    | N/A               | Instrument: | HPMS11           |
| Client ID:    | 0309-PW-092817   | Prep Method:       | 5030B/5030C/5035A | Prep Date:  | N/A              |
| Matrix:       | Water            | Analytical Method: | 8260B             | Cal Date:   | 10/02/2017 23:16 |
| Workgroup #:  | WG632950         | Analyst:           | JDS               | Run Date:   | 10/06/2017 20:52 |
| Collect Date: | 09/28/2017 14:25 | Dilution:          | 1                 | File ID:    | 11M22065         |
| Sample Tag:   | 01               | Units:             | ug/L              |             |                  |

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        | U    | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 |        | U    | 1.00 | 0.125 |
| Chloroform                | 67-66-3  |        | U    | 1.00 | 0.125 |
| Dibromochloromethane      | 124-48-1 |        | U    | 1.00 | 0.250 |
| Dichlorodifluoromethane   | 75-71-8  |        | U    | 1.00 | 0.250 |
| Chloromethane             | 74-87-3  |        | U    | 1.00 | 0.500 |
| cis-1,2-Dichloroethene    | 156-59-2 |        | U    | 1.00 | 0.250 |
| Diethyl ether             | 60-29-7  | 81.5   |      | 10.0 | 5.00  |
| Ethylbenzene              | 100-41-4 |        | U    | 1.00 | 0.250 |
| Methylene chloride        | 75-09-2  |        | U    | 1.00 | 0.250 |
| Naphthalene               | 91-20-3  |        | U    | 1.00 | 0.200 |
| Styrene                   | 100-42-5 |        | U    | 1.00 | 0.125 |
| Tetrachloroethene         | 127-18-4 |        | U    | 1.00 | 0.250 |
| Toluene                   | 108-88-3 |        | U    | 1.00 | 0.250 |
| trans-1,2-Dichloroethene  | 156-60-5 |        | U    | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                | CAS #  | Result      |             | Qual | RL   | MDL   |
|------------------------|--|-------------|-------------|------|------|-------|
| Trichloroethene        | 79-01-6  |             |             | U    | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4  |             |             | U    | 1.00 | 0.250 |
| Vinyl chloride         | 75-01-4  |             |             | U    | 1.00 | 0.250 |
| Xylenes                | 1330-20-7  |             |             | U    | 1.00 | 0.500 |
| Surrogate              | Recovery   | Lower Limit | Upper Limit | Q    |      |       |
| 1,2-Dichloroethane-d4  | 88.7   | 70          | 120         |      |      |       |
| 4-Bromofluorobenzene   | 100  | 75          | 120         |      |      |       |
| Dibromofluoromethane   | 91.0   | 85          | 115         |      |      |       |
| Toluene-d8             | 94.1   | 85          | 120         |      |      |       |
| U                      | Not detected at or above the reporting limit (RL). |             |             |      |      |       |

Sample #: L17100037-05

PrePrep Method: N/A

Instrument: HPMS11

Client ID: 0310-PW-092817

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 10/02/2017 23:16

Workgroup #: WG632950

Analyst: JDS

Run Date: 10/06/2017 21:22

Collect Date: 09/28/2017 15:50

Dilution: 1

File ID: 11M22066

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result |  | Qual | RL   | MDL   |
|---------------------------|----------|--------|--|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        |  | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        |  | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        |  | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        |  | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        |  | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        |  | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        |  | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        |  | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        |  | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        |  | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        |  | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        |  | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        |  | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        |  | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        |  | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        |  | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        |  | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        |  | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        |  | U    | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 |        |  | U    | 1.00 | 0.125 |
| Chloroform                | 67-66-3  |        |  | U    | 1.00 | 0.125 |

## Certificate of Analysis

| Analyte                  | CAS #  | Result      | Qual        | RL   | MDL   |
|--------------------------|--|-------------|-------------|------|-------|
| Dibromochloromethane     | 124-48-1   |             | U           | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8  |             | U           | 1.00 | 0.250 |
| Chloromethane            | 74-87-3  |             | U           | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2   |             | U           | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7  | 16.7        |             | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4   |             | U           | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2  |             | U           | 1.00 | 0.250 |
| Naphthalene              | 91-20-3  |             | U           | 1.00 | 0.200 |
| Styrene                  | 100-42-5   |             | U           | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4   |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3   |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5   |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6  |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4  |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4  |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7  |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery   | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 87.3   | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 98.6   | 75          | 120         |      |       |
| Dibromofluoromethane     | 89.1   | 85          | 115         |      |       |
| Toluene-d8               | 91.9   | 85          | 120         |      |       |
| U                        | Not detected at or above the reporting limit (RL). |             |             |      |       |

Sample #: L17100037-06

PrePrep Method: N/A

Instrument: HPMS11

Client ID: 0311-PW-092817

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 10/02/2017 23:16

Workgroup #: WG632950

Analyst: JDS

Run Date: 10/06/2017 21:52

Collect Date: 09/28/2017 17:40

Dilution: 1

File ID: 11M22067

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                  | CAS #  | Result      | Qual        | RL   | MDL   |
|--------------------------|--|-------------|-------------|------|-------|
| 1,3-Dichlorobenzene      | 541-73-1   |             | U           | 1.00 | 0.250 |
| 2-Butanone               | 78-93-3  |             | U           | 5.00 | 2.50  |
| 4-Methyl-2-pentanone     | 108-10-1   |             | U           | 5.00 | 2.50  |
| Acetone                  | 67-64-1  |             | U           | 5.00 | 2.50  |
| 2-Hexanone               | 591-78-6   |             | U           | 5.00 | 2.50  |
| Benzene                  | 71-43-2  |             | U           | 1.00 | 0.125 |
| Bromodichloromethane     | 75-27-4  |             | U           | 1.00 | 0.250 |
| Bromomethane             | 74-83-9  |             | U           | 1.00 | 0.500 |
| Carbon disulfide         | 75-15-0  |             | U           | 1.00 | 0.500 |
| Carbon tetrachloride     | 56-23-5  |             | U           | 1.00 | 0.250 |
| Chlorobenzene            | 108-90-7   |             | U           | 1.00 | 0.125 |
| Chloroform               | 67-66-3  |             | U           | 1.00 | 0.125 |
| Dibromochloromethane     | 124-48-1   |             | U           | 1.00 | 0.250 |
| Dichlorodifluoromethane  | 75-71-8  |             | U           | 1.00 | 0.250 |
| Chloromethane            | 74-87-3  |             | U           | 1.00 | 0.500 |
| cis-1,2-Dichloroethene   | 156-59-2   |             | U           | 1.00 | 0.250 |
| Diethyl ether            | 60-29-7  | 59.1        |             | 10.0 | 5.00  |
| Ethylbenzene             | 100-41-4   |             | U           | 1.00 | 0.250 |
| Methylene chloride       | 75-09-2  |             | U           | 1.00 | 0.250 |
| Naphthalene              | 91-20-3  | 31.4        |             | 1.00 | 0.200 |
| Styrene                  | 100-42-5   |             | U           | 1.00 | 0.125 |
| Tetrachloroethene        | 127-18-4   |             | U           | 1.00 | 0.250 |
| Toluene                  | 108-88-3   |             | U           | 1.00 | 0.250 |
| trans-1,2-Dichloroethene | 156-60-5   |             | U           | 1.00 | 0.250 |
| Trichloroethene          | 79-01-6  |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane   | 75-69-4  |             | U           | 1.00 | 0.250 |
| Vinyl chloride           | 75-01-4  |             | U           | 1.00 | 0.250 |
| Xylenes                  | 1330-20-7  |             | U           | 1.00 | 0.500 |
| Surrogate                | Recovery   | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4    | 90.9   | 70          | 120         |      |       |
| 4-Bromofluorobenzene     | 104  | 75          | 120         |      |       |
| Dibromofluoromethane     | 93.7   | 85          | 115         |      |       |
| Toluene-d8               | 93.4   | 85          | 120         |      |       |
| U                        | Not detected at or above the reporting limit (RL). |             |             |      |       |

## Certificate of Analysis

Sample #: L17100037-07

PrePrep Method: N/A

Instrument: HPMS11

Client ID: INS-TB01-092817

Prep Method: 5030B/5030C/5035A

Prep Date: N/A

Matrix: Water

Analytical Method: 8260B

Cal Date: 10/02/2017 23:16

Workgroup #: WG632950

Analyst: JDS

Run Date: 10/06/2017 15:01

Collect Date: 09/28/2017 18:00

Dilution: 1

File ID: 11M22053

Sample Tag: 01

Units: ug/L

| Analyte                   | CAS #    | Result | Qual | RL   | MDL   |
|---------------------------|----------|--------|------|------|-------|
| 1,1,2,2-Tetrachloroethane | 79-34-5  |        | U    | 1.00 | 0.200 |
| 1,1,2-Trichloroethane     | 79-00-5  |        | U    | 1.00 | 0.250 |
| 1,1-Dichloroethane        | 75-34-3  |        | U    | 1.00 | 0.125 |
| 1,1-Dichloroethene        | 75-35-4  |        | U    | 1.00 | 0.500 |
| 1,2-Dichloroethane        | 107-06-2 |        | U    | 1.00 | 0.250 |
| 1,2-Dichloropropane       | 78-87-5  |        | U    | 1.00 | 0.200 |
| 1,2,4-Trimethylbenzene    | 95-63-6  |        | U    | 1.00 | 0.250 |
| 1,4-Dichlorobenzene       | 106-46-7 |        | U    | 1.00 | 0.125 |
| 1,3,5-Trimethylbenzene    | 108-67-8 |        | U    | 1.00 | 0.250 |
| 1,3-Dichlorobenzene       | 541-73-1 |        | U    | 1.00 | 0.250 |
| 2-Butanone                | 78-93-3  |        | U    | 5.00 | 2.50  |
| 4-Methyl-2-pentanone      | 108-10-1 |        | U    | 5.00 | 2.50  |
| Acetone                   | 67-64-1  |        | U    | 5.00 | 2.50  |
| 2-Hexanone                | 591-78-6 |        | U    | 5.00 | 2.50  |
| Benzene                   | 71-43-2  |        | U    | 1.00 | 0.125 |
| Bromodichloromethane      | 75-27-4  |        | U    | 1.00 | 0.250 |
| Bromomethane              | 74-83-9  |        | U    | 1.00 | 0.500 |
| Carbon disulfide          | 75-15-0  |        | U    | 1.00 | 0.500 |
| Carbon tetrachloride      | 56-23-5  |        | U    | 1.00 | 0.250 |
| Chlorobenzene             | 108-90-7 |        | U    | 1.00 | 0.125 |
| Chloroform                | 67-66-3  |        | U    | 1.00 | 0.125 |
| Dibromochloromethane      | 124-48-1 |        | U    | 1.00 | 0.250 |
| Dichlorodifluoromethane   | 75-71-8  |        | U    | 1.00 | 0.250 |
| Chloromethane             | 74-87-3  |        | U    | 1.00 | 0.500 |
| cis-1,2-Dichloroethene    | 156-59-2 |        | U    | 1.00 | 0.250 |
| Diethyl ether             | 60-29-7  |        | U    | 10.0 | 5.00  |
| Ethylbenzene              | 100-41-4 |        | U    | 1.00 | 0.250 |
| Methylene chloride        | 75-09-2  |        | U    | 1.00 | 0.250 |
| Naphthalene               | 91-20-3  |        | U    | 1.00 | 0.200 |
| Styrene                   | 100-42-5 |        | U    | 1.00 | 0.125 |
| Tetrachloroethene         | 127-18-4 |        | U    | 1.00 | 0.250 |
| Toluene                   | 108-88-3 |        | U    | 1.00 | 0.250 |
| trans-1,2-Dichloroethene  | 156-60-5 |        | U    | 1.00 | 0.250 |

## Certificate of Analysis

| Analyte                | CAS #  | Result      | Qual        | RL   | MDL   |
|------------------------|--|-------------|-------------|------|-------|
| Trichloroethene        | 79-01-6  |             | U           | 1.00 | 0.250 |
| Trichlorofluoromethane | 75-69-4  |             | U           | 1.00 | 0.250 |
| Vinyl chloride         | 75-01-4  |             | U           | 1.00 | 0.250 |
| Xylenes                | 1330-20-7  |             | U           | 1.00 | 0.500 |
| Surrogate              | Recovery   | Lower Limit | Upper Limit | Q    |       |
| 1,2-Dichloroethane-d4  | 88.5   | 70          | 120         |      |       |
| 4-Bromofluorobenzene   | 102  | 75          | 120         |      |       |
| Dibromofluoromethane   | 93.9   | 85          | 115         |      |       |
| Toluene-d8             | 95.5   | 85          | 120         |      |       |
| U                      | Not detected at or above the reporting limit (RL). |             |             |      |       |

## **2.1.1.2 QC Summary Data**

## Example 8260 Calculations

### 1.0 Calculating the Response Factor (RF) from the initial calibration (ICAL) data:

$$RF = [ (Ax) (Cis) ] / [ (Ais) (Cx) ]$$

where:

|   |         |
|---|---------|
| Ax = Area of the characteristic ion for the compound being measured:      | 3399156 |
| Cis = Concentration of the specific internal standard (ug/mL)             | 25      |
| Ais = Area of the characteristic ion of the specific internal standard    | 846471  |
| Cx = Concentration of the compound in the standard being measured (ug/mL) | 100     |
| RF = Calculated Response Factor   | 1.0039  |

### 2.0 Calculating the concentration ( C ) of a compound in water using the average RF: \*

$$Cx = [ (Ax) (Cis) (Vn)(D) ] / [ (Ais) (RF) (Vs) ]$$

where:

|  |          |
|--|----------|
| Ax = Area of the characteristic ion for the compound being measured    | 3122498  |
| Cis = Concentration of the specific internal standard (ug/L)           | 25       |
| D = Dilution factor for sample as a multiplier ( 10x = 10 )            | 1        |
| Ais = Area of the characteristic ion of the specific internal standard | 611048   |
| RF = Average RF from the ICAL  | 1.004    |
| Vs = Purge volume of sample (mL)                                       | 10       |
| Vn = Nominal purge volume of sample (mL) ( 10.0 mL )                   | 10       |
| Cx = Concentration of the compound in the sample being measured (ug/L) | 127.2428 |

### 3.0 Calculating the concentration ( C ) of a compound in soil using the average RF: \*

$$Cx = [ (Ax) (Cis) (Wn)(D) ] / [ (Ais) (RF) (Ws) ]$$

where:

|  |          |
|--|----------|
| Ax = Area of the characteristic ion for the compound being measured    | 3122498  |
| Cis = Concentration of the specific internal standard (ug/L)           | 25       |
| D = Dilution factor for sample as a multiplier ( 10x = 10 )            | 1        |
| Ais = Area of the characteristic ion of the specific internal standard | 611048   |
| RF = Average RF from the ICAL  | 1.004    |
| Ws = Weight of sample purged (g)                                       | 5        |
| Wn = Nominal purge weight (g) ( 5.0 g )                                | 5        |
| Cx = Concentration of the compound in the sample being measured (ug/L) | 127.2428 |

Dry weight correction:

|                        |          |
|------------------------|----------|
| Percent solids (PCT_S) | 50       |
| Cd = (Cx) (100)/PCT_S  | 254.4856 |

\* Concentrations appearing on the instrument quantitation reports are on-column results and do not take into account initial volume, final volume, and the dilution factor.

### 4.0 Concentration from Linear Regression

Step 1: Retrieve Curve Data From Plot,  $y = mx + b$

$y$  = response ratio = response of analyte / response of IS = Ax/Ais

$x$  = amount ratio = concentration analyte/concentration internal standard = Cx / Cis

$m$  = slope from curve = 0.213

$b$  = intercept from curve = - 0.00642

**Step 2: Calculate y from Quantitation Report**

$$y = 86550/593147 = 0.1459$$

**Step 3: Solve for x**

$$x = (y - b)/m = [(0.1459 - (-0.00642))/0.213 = 0.7152]$$

**Step 4: Solve for analyte concentration C<sub>x</sub>**

$$C_x = C_{IS} (x) = (25.0)(0.7152) = 17.88$$

**Example Spreadsheet Calculation:**

|   |          |
|---|----------|
| Slope from curve, m:                          | 0.213    |
| Intercept from curve, b:                      | -0.00642 |
| Area of analyte, A <sub>x</sub> :             | 86550    |
| Area of Internal Standard , A <sub>IS</sub> : | 593147   |
| Concentration of IS, C <sub>IS</sub>          | 25.00    |
| Response Ratio:                               | 0.145917 |
| Amount Ratio:                                 | 0.715195 |
| Concentration:                                | 17.87988 |
| Units of Internal Standard:                   | ug/L     |

**5.0 Concentration from Quadratic Regression****Step 1 - Retrieve Curve Data from Plot,  $y = Ax^2 + Bx + C$** 

Where:

$$Ax^2 + Bx + (C - y) = 0$$

A, B, C = constants from the ICAL quadratic regression

 $y$  = Response ratio = Area of analyte/Area of internal standard (IS) $x$  = Amount ratio = Concentration of analyte/concentration of IS**Step 2: Calculate y from Quantitation Report**

$$y = Ax/A_{IS}$$

**Step 3: Solve for x using the quadratic formula**

$$Ax^2 + Bx + C - y = 0$$

$$x = \frac{b \pm \sqrt{(b^2 - 4a(c - y))}}{2a} \quad (\text{Two possible solutions})$$

**Step 4: Solve for analyte concentration C<sub>x</sub>**

$$C_x = (C_{IS})(\text{Amount ratio})$$

**Example Spreadsheet Calculation:**

|  |                            |
|--|----------------------------|
| Value of A from plot:                      | -0.00629                   |
| Value of B from plot:                      | 0.511                      |
| Value of C from plot:                      | -0.0276                    |
| Area of unknown from quantitation report:  | 293821                     |
| Area of IS from quantitation report:       | 784848                     |
| Response ratio, y:                         | 0.374367                   |
| C - y:                                     | -0.40197                   |
| Root 1 - Computed amount ratio , X1:       | 80.44567                   |
| Root 2 - Computed amount ratio , X2:       | 0.794396 use this solution |
| Concentration of IS, C <sub>IS</sub> :     | 25.00                      |
| Concentration of analyte, C <sub>x</sub> : | 19.86 ug/L                 |

## Microbac Laboratories Inc.

## Instrument Run Log

|             |                    |           |                   |
|-------------|--------------------|-----------|-------------------|
| Instrument: | HPMS11             | Dataset:  | 062217            |
| Analyst1:   | JDS                | Analyst2: | NA                |
| Method:     | 8260               | SOP:      | MSV01, OVAP MSV01 |
| Method:     | 5035, 5030B, 5030C | SOP:      | PAT01, OVAP PAT01 |
| Method:     | 624                | SOP:      | MSV10             |

Maintenance Log ID: \_\_\_\_\_

|                    |          |                     |            |
|--------------------|----------|---------------------|------------|
| Internal Standard: | STD82340 | Surrogate Standard: | STD82339   |
| CCV:               | STD82436 | LCS:                | STD82448   |
|                    |          |                     | MS/MSD: NA |

|              |                   |              |    |
|--------------|-------------------|--------------|----|
| Column 1 ID: | RTX502.2          | Column 2 ID: | NA |
| Workgroups:  | WG618911 WG618912 |              |    |

Comments: Alt. Src. failed high for Acrolein. All reported samples requiring Acrolein were ND.

| File ID  | Sample Information                 | pH | Mat | Dil | Reference | Date/Time      |
|----------|------------------------------------|----|-----|-----|-----------|----------------|
| 11M19216 | WG618910-01 BFB 50ng 8260          | NA | 1   | 1   | STD82467  | 06/22/17 11:03 |
| 11M19217 | WG618910-02 50ug/L CCV 8260        | NA | 1   | 1   | STD82436  | 06/22/17 11:27 |
| 11M19218 | WG618910-02 50ug/L CCV 8260        | NA | 1   | 1   | STD82436  | 06/22/17 12:03 |
| 11M19219 | WG618912-01 5ug/L ICAL 826-A9      | NA | 1   | 1   | STD82519  | 06/22/17 12:32 |
| 11M19220 | WG618912-02 20ug/L ICAL 826-A9     | NA | 1   | 1   | STD82519  | 06/22/17 13:02 |
| 11M19221 | WG618912-03 50ug/L ICAL 826-A9     | NA | 1   | 1   | STD82519  | 06/22/17 13:31 |
| 11M19222 | WG618912-04 100ug/L ICAL 826-A9    | NA | 1   | 1   | STD82519  | 06/22/17 14:01 |
| 11M19223 | WG618912-05 200ug/L ICAL 826-A9    | NA | 1   | 1   | STD82519  | 06/22/17 14:31 |
| 11M19224 | WG618912-06 300ug/L ICAL 826-A9    | NA | 1   | 1   | STD82519  | 06/22/17 14:59 |
| 11M19225 | WG618912-07 400ug/L ICAL 826-A9    | NA | 1   | 1   | STD82519  | 06/22/17 15:29 |
| 11M19226 | WG618912-08 500ug/L ICAL 826-A9    | NA | 1   | 1   | STD82519  | 06/22/17 15:58 |
| 11M19227 | RINSE                              | NA | 1   | 1   |           | 06/22/17 16:27 |
| 11M19228 | WG618912-09 100ug/L ICV/ALT 826-A9 | NA | 1   | 1   | STD82415  | 06/22/17 16:57 |
| 11M19229 | WG618911-01 BLANK 8260             | NA | 1   | 1   |           | 06/22/17 17:27 |
| 11M19230 | WG618911-02 20ug/L LCS 8260        | NA | 1   | 1   | STD82448  | 06/22/17 17:56 |
| 11M19231 | WG618911-03 20ug/L LCS2 8260       | NA | 1   | 1   | STD82448  | 06/22/17 18:26 |
| 11M19232 | L17061104-01 A 826-BETX            | <2 | 1   | 1   |           | 06/22/17 18:55 |
| 11M19233 | L17061103-12 A TB 826-SPE          | <2 | 1   | 1   |           | 06/22/17 19:25 |
| 11M19234 | L17061103-01 A 826-SPE             | <2 | 1   | 1   |           | 06/22/17 19:54 |
| 11M19235 | L17061103-03 A 826-SPE             | <2 | 1   | 1   |           | 06/22/17 20:23 |
| 11M19236 | L17061103-05 A 826-SPE             | <2 | 1   | 1   |           | 06/22/17 20:53 |
| 11M19237 | L17061103-07 A 826-SPE             | <2 | 1   | 1   |           | 06/22/17 21:22 |
| 11M19238 | L17061103-09 A 826-SPE             | <2 | 1   | 1   |           | 06/22/17 21:51 |
| 11M19239 | L17061103-11 A 826-SPE             | <2 | 1   | 1   |           | 06/22/17 22:20 |
| 11M19240 | RINSE                              | NA | 1   | 1   |           | 06/22/17 22:49 |
| 11M19241 | WG618911-04 BLANK2 624             | NA | 2   | 1   |           | 06/22/17 23:18 |
| 11M19242 | L17061150-01 A 624                 | <2 | 2   | 1   |           | 06/22/17 23:48 |
| 11M19243 | L17061154-01 A 624-SPE             | 7  | 2   | 1   |           | 06/23/17 00:17 |
| 11M19244 | L17061152-01 A 624-SPE2            | 6  | 2   | 1   |           | 06/23/17 00:46 |
| 11M19245 | CCV                                | NA | 2   | 1   |           | 06/23/17 01:15 |
| 11M19246 | RINSE                              | NA | 2   | 1   |           | 06/23/17 01:45 |
| 11M19247 | RINSE                              | NA | 2   | 1   |           | 06/23/17 02:14 |

Approved: June 23, 2017

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*Sarah Vandenberg*

## Microbac Laboratories Inc.

## Instrument Run Log

|             |                    |           |                   |
|-------------|--------------------|-----------|-------------------|
| Instrument: | HPMS11             | Dataset:  | 062217            |
| Analyst1:   | JDS                | Analyst2: | NA                |
| Method:     | 8260               | SOP:      | MSV01, OVAP MSV01 |
| Method:     | 5035, 5030B, 5030C | SOP:      | PAT01, OVAP PAT01 |
| Method:     | 624                | SOP:      | MSV10             |

Maintenance Log ID: \_\_\_\_\_

|                    |          |                     |          |
|--------------------|----------|---------------------|----------|
| Internal Standard: | STD82340 | Surrogate Standard: | STD82339 |
| CCV:               | STD82436 | LCS:                | STD82448 |

|              |                   |              |    |
|--------------|-------------------|--------------|----|
| Column 1 ID: | RTX502.2          | Column 2 ID: | NA |
| Workgroups:  | WG618911 WG618912 |              |    |

Comments: Alt. Src. failed high for Acrolein. All reported samples requiring Acrolein were ND.

Comments

| Seq.   | Rerun    | Dil. | Reason                 | Analytes |
|--|----------|------|------------------------|----------|
| 2  | X        |      | Check Standard Failure |          |
| File ID:                                       | 11M19217 |      |                        |          |
| WG618910-02 CCV multiple cmpds. failed low. RR |          |      |                        |          |

Approved: June 23, 2017

*Sarah Vandenberg*

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## Microbac Laboratories Inc.

## Instrument Run Log

|             |                    |           |                   |           |
|-------------|--------------------|-----------|-------------------|-----------|
| Instrument: | HPMS11             | Dataset:  | 100217            |           |
| Analyst1:   | JDS                | Analyst2: | NA                |           |
| Method:     | 8260               | SOP:      | MSV01, OVAP MSV01 | Rev: 25,0 |
| Method:     | 5035, 5030B, 5030C | SOP:      | PAT01, OVAP PAT01 | Rev: 19,1 |

Maintenance Log ID: \_\_\_\_\_

|                             |          |                     |          |            |
|-----------------------------|----------|---------------------|----------|------------|
| Internal Standard:          | STD83895 | Surrogate Standard: | STD83896 |            |
| CCV:                        | STD84160 | LCS:                | STD84177 | MS/MSD: NA |
| Column 1 ID: RTX502.2       |          | Column 2 ID: NA     |          |            |
| Workgroups: WG632177 (ICAL) |          |                     |          |            |

Comments: \_\_\_\_\_

| File ID  | Sample Information            | pH | Mat | Dil | Reference | Date/Time      |
|----------|-------------------------------|----|-----|-----|-----------|----------------|
| 11M21910 | WG632177-01 50ng BFB STD 8260 | NA | 1   | 1   | STD834001 | 10/02/17 14:54 |
| 11M21911 | RINSE                         | NA | 1   | 1   |           | 10/02/17 15:19 |
| 11M21912 | RINSE                         | NA | 1   | 1   |           | 10/02/17 15:49 |
| 11M21914 | WG632177-02 .3ug/L ICAL 8260  | NA | 1   | 1   | STD84160  | 10/02/17 16:54 |
| 11M21916 | RINSE                         | NA | 1   | 1   |           | 10/02/17 18:51 |
| 11M21917 | WG632177-03 .4ug/L ICAL 826   | NA | 1   | 1   | STD84160  | 10/02/17 19:21 |
| 11M21918 | WG632177-04 1 ug/L ICAL       | NA | 1   | 1   | STD84160  | 10/02/17 19:50 |
| 11M21919 | WG632177-05 2ug/L ICAL 8260   | NA | 1   | 1   | STD84160  | 10/02/17 20:19 |
| 11M21920 | WG632177-06 5ug/L ICAL 8260   | NA | 1   | 1   | STD84160  | 10/02/17 20:49 |
| 11M21921 | WG632177-07 20ug/L ICAL 8260  | NA | 1   | 1   | STD84160  | 10/02/17 21:18 |
| 11M21922 | WG632177-08 50ug/L ICAL 8260  | NA | 1   | 1   | STD84160  | 10/02/17 21:47 |
| 11M21923 | WG632177-09 100ug/L ICAL 8260 | NA | 1   | 1   | STD84160  | 10/02/17 22:16 |
| 11M21924 | WG632177-10 200ug/L ICAL 8260 | NA | 1   | 1   | STD84160  | 10/02/17 22:46 |
| 11M21925 | WG632177-11 300ug/L ICAL 8260 | NA | 1   | 1   | STD84160  | 10/02/17 23:16 |
| 11M21926 | RINSE                         | NA | 1   | 1   |           | 10/02/17 23:46 |
| 11M21927 | WG632177-12 50ug/L ICV 8260   | NA | 1   | 1   | STD84177  | 10/03/17 00:15 |

Comments

| Seq.   | Rerun | Dil. | Reason | Analytes |
|--|-------|------|--------|----------|
| 15   | X     |      |        |          |
| File ID: 11M21927  |       |      |        |          |
| WG632177-12 multiple failures in Alt. Src. had RR on 10/3/17 |       |      |        |          |

Approved: October 05, 2017

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## Microbac Laboratories Inc.

## Instrument Run Log

|             |                    |           |                   |           |
|-------------|--------------------|-----------|-------------------|-----------|
| Instrument: | HPMS11             | Dataset:  | 100317            |           |
| Analyst1:   | JDS                | Analyst2: | NA                |           |
| Method:     | 8260               | SOP:      | MSV01, OVAP MSV01 | Rev: 25,0 |
| Method:     | 5035, 5030B, 5030C | SOP:      | PAT01, OVAP PAT01 | Rev: 19,1 |

Maintenance Log ID: \_\_\_\_\_

|                    |          |                     |          |                  |
|--------------------|----------|---------------------|----------|------------------|
| Internal Standard: | STD83895 | Surrogate Standard: | STD83896 |                  |
| CCV:               | STD84160 | LCS:                | STD84177 | MS/MSD: STD84177 |
| Column 1 ID:       | RTX502.2 | Column 2 ID:        | NA       |                  |
| Workgroups:        | WG632394 |                     |          |                  |

Comments: \_\_\_\_\_

| File ID  | Sample Information             | pH | Mat | Dil | Reference | Date/Time      |
|----------|--------------------------------|----|-----|-----|-----------|----------------|
| 11M21928 | WG632393-01 50ng BFB STD 8260  | NA | 1   | 1   | STD84001  | 10/03/17 16:41 |
| 11M21929 | WG632393-02 50ug/L CCV 8260    | NA | 1   | 1   | STD84160  | 10/03/17 17:06 |
| 11M21930 | WG632177-12 50ug/L ICV 8260    | NA | 1   | 1   | STD84177  | 10/03/17 17:38 |
| 11M21931 | WG000000-01 100ug/L CCV 8260   | NA | 1   | 1   | STD00000  | 10/03/17 18:17 |
| 11M21932 | WG632394-01 BLANK 8260         | NA | 1   | 1   |           | 10/03/17 18:46 |
| 11M21933 | WG632394-02 20ug/kg LCS 8260   | NA | 1   | 1   | STD84177  | 10/03/17 19:15 |
| 11M21934 | L17091759-33 A MS 826-SPE      | 6  | 1   | 1   | STD84177  | 10/03/17 19:45 |
| 11M21935 | L17091759-34 A MSD 826-SPE     | 6  | 1   | 1   | STD84177  | 10/03/17 20:15 |
| 11M21936 | L17091578-02 10X AF 826-TC     | NA | 17  | 10  |           | 10/03/17 20:44 |
| 11M21937 | L17091759-32 A REF 826-SPE     | 6  | 1   | 1   |           | 10/03/17 21:13 |
| 11M21938 | L17091759-01 A 826-SPE         | 6  | 1   | 1   |           | 10/03/17 21:43 |
| 11M21939 | L17091759-24 A 826-SPE         | 6  | 1   | 1   |           | 10/03/17 22:13 |
| 11M21940 | L17091759-08 B A1 826-SPE      | 6  | 1   | 1   |           | 10/03/17 22:42 |
| 11M21941 | L17091759-36 A 826-SPE         | 6  | 1   | 1   |           | 10/03/17 23:12 |
| 11M21942 | L17091752-50 A 826-SPE         | 6  | 1   | 1   |           | 10/03/17 23:41 |
| 11M21943 | L17091752-53 A 826-SPE         | 6  | 1   | 1   |           | 10/04/17 00:11 |
| 11M21944 | L17091752-56 A 826-SPE         | 6  | 1   | 1   |           | 10/04/17 00:41 |
| 11M21945 | L17091752-57 A 826-SPE         | 7  | 1   | 1   |           | 10/04/17 01:11 |
| 11M21946 | L17091752-58 A 826-SPE         | 7  | 1   | 1   |           | 10/04/17 01:40 |
| 11M21947 | L17091759-09 B A1 826-SPE      | 7  | 1   | 1   |           | 10/04/17 02:10 |
| 11M21948 | L17091752-54 A 826-SPE         | 7  | 1   | 1   |           | 10/04/17 02:40 |
| 11M21949 | L17091752-55 A 826-SPE         | 6  | 1   | 1   |           | 10/04/17 03:09 |
| 11M21950 | L17091752-51 A 826-SPE         | 7  | 1   | 1   |           | 10/04/17 03:39 |
| 11M21951 | L17091752-52 A 826-SPE         | 6  | 1   | 1   |           | 10/04/17 04:09 |
| 11M21952 | CCV                            | NA | 1   | 1   |           | 10/04/17 04:38 |
| 11M21953 | RINSE                          | NA | 1   | 1   |           | 10/04/17 05:08 |
| 11M21954 | RINSE                          | NA | 1   | 1   |           | 10/04/17 05:37 |
| 11M21955 | WG631650-01 10X AF FBLK 826-TC | NA | 17  | 10  |           | 10/04/17 06:07 |

Comments

| Seq. | Rerun | Dil. | Reason                 | Analytes |
|------|-------|------|------------------------|----------|
| 2    |       |      | Check Standard Failure |          |

File ID: 11M21929

Approved: October 05, 2017

*Sarah Vandenberg*

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## Microbac Laboratories Inc.

## Instrument Run Log

|                                   |                               |
|-----------------------------------|-------------------------------|
| Instrument: <u>HPMS11</u>         | Dataset: <u>100317</u>        |
| Analyst1: <u>JDS</u>              | Analyst2: <u>NA</u>           |
| Method: <u>8260</u>               | SOP: <u>MSV01, OVAP MSV01</u> |
| Method: <u>5035, 5030B, 5030C</u> | SOP: <u>PAT01, OVAP PAT01</u> |
|                                   | Rev: <u>25,0</u>              |
|                                   | Rev: <u>19,1</u>              |

Maintenance Log ID: \_\_\_\_\_

|                                    |                                     |                         |
|------------------------------------|-------------------------------------|-------------------------|
| Internal Standard: <u>STD83895</u> | Surrogate Standard: <u>STD83896</u> |                         |
| CCV: <u>STD84160</u>               | LCS: <u>STD84177</u>                | MS/MSD: <u>STD84177</u> |
| Column 1 ID: <u>RTX502.2</u>       | Column 2 ID: <u>NA</u>              |                         |
| Workgroups: <u>WG632394</u>        |                                     |                         |

Comments: \_\_\_\_\_

Comments

| Seq. | Rerun | Dil. | Reason  | Analytes |
|------|-------|------|---|----------|
|      |       |      | WG632393-02 CCV failed low for Ace. and Benz. |          |

Approved: October 05, 2017Sarah Vandenberg

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## Microbac Laboratories Inc.

## Instrument Run Log

|             |                    |           |                   |           |
|-------------|--------------------|-----------|-------------------|-----------|
| Instrument: | HPMS11             | Dataset:  | 100617            |           |
| Analyst1:   | JDS                | Analyst2: | NA                |           |
| Method:     | 8260               | SOP:      | MSV01, OVAP MSV01 | Rev: 25,0 |
| Method:     | 5035, 5030B, 5030C | SOP:      | PAT01, OVAP PAT01 | Rev: 19,1 |

Maintenance Log ID: \_\_\_\_\_

|                             |                              |
|-----------------------------|------------------------------|
| Internal Standard: STD83895 | Surrogate Standard: STD83896 |
| CCV: STD84160               | LCS: STD84177                |
| Column 1 ID: RTX502.2       | Column 2 ID: NA              |

Workgroups: WG632950 WG633034

Comments: Alt. Src. failed low for Diox. and high for acrolein. The following will need to RR due to low failing Diox. in Alt. Src.: 1703-01, 02, 03, 04

| File ID  | Sample Information               | pH | Mat | Dil  | Reference | Date/Time      |
|----------|----------------------------------|----|-----|------|-----------|----------------|
| 11M22045 | WG632949-01 50ng BFB STD 8260    | NA | 1   | 1    | STD84001  | 10/06/17 11:09 |
| 11M22046 | WG632949-02 50ug/L CCV 8260      | NA | 1   | 1    | STD84160  | 10/06/17 11:33 |
| 11M22047 | WG000000-01 100ug/L CCV 8260     | NA | 1   | 1    | STD00000  | 10/06/17 12:05 |
| 11M22048 | WG632950-01 BLANK 8260           | NA | 1   | 1    |           | 10/06/17 12:34 |
| 11M22049 | WG632950-02 20ug/kg LCS 8260     | NA | 1   | 1    | STD84267  | 10/06/17 13:04 |
| 11M22050 | L17100109-03 A MS 826-SPE        | NA | 1   | 1    | STD84267  | 10/06/17 13:33 |
| 11M22051 | L17100109-04 A MSD 826-SPE       | NA | 1   | 1    | STD84267  | 10/06/17 14:03 |
| 11M22052 | L17091703-04 A TB 826-SPE        | <2 | 1   | 1    |           | 10/06/17 14:32 |
| 11M22053 | L17100037-07 A TB 826-SPE        | <2 | 1   | 1    |           | 10/06/17 15:01 |
| 11M22054 | L17100109-09 A TB 826-SPE        | <2 | 1   | 1    |           | 10/06/17 15:30 |
| 11M22055 | L17091703-01 A EB 826-SPE        | <2 | 1   | 1    |           | 10/06/17 16:00 |
| 11M22056 | L17100037-01 A EB 826-SPE        | <2 | 1   | 1    |           | 10/06/17 16:29 |
| 11M22057 | L17100148-02 B 00 20X 826-SPE    | <2 | 1   | 20   |           | 10/06/17 16:58 |
| 11M22058 | L17100148-01 B D1 1,000X 826-SPE | <2 | 1   | 1000 |           | 10/06/17 17:27 |
| 11M22059 | L17100109-01 A EB 826-SPE        | <2 | 1   | 1    |           | 10/06/17 17:57 |
| 11M22060 | L17100109-02 A REF 826-SPE       | <2 | 1   | 1    |           | 10/06/17 18:27 |
| 11M22061 | L17091703-02 A 826-SPE           | <2 | 1   | 1    |           | 10/06/17 18:56 |
| 11M22062 | L17091703-03 A 826-SPE           | <2 | 1   | 1    |           | 10/06/17 19:25 |
| 11M22063 | L17100037-02 A 826-SPE           | <2 | 1   | 1    |           | 10/06/17 19:54 |
| 11M22064 | L17100037-03 A 826-SPE           | <2 | 1   | 1    |           | 10/06/17 20:23 |
| 11M22065 | L17100037-04 A 826-SPE           | <2 | 1   | 1    |           | 10/06/17 20:52 |
| 11M22066 | L17100037-05 A 826-SPE           | <2 | 1   | 1    |           | 10/06/17 21:22 |
| 11M22067 | L17100037-06 A 826-SPE           | <2 | 1   | 1    |           | 10/06/17 21:52 |
| 11M22068 | L17100109-05 A 826-SPE           | <2 | 1   | 1    |           | 10/06/17 22:21 |
| 11M22069 | L17100109-06 A 826-SPE           | <2 | 1   | 1    |           | 10/06/17 22:51 |
| 11M22070 | RINSE                            | NA | 1   | 1    |           | 10/06/17 23:20 |
| 11M22071 | WG633034-01 20ug/L LCS 624       | NA | 2   | 1    | STD84267  | 10/06/17 23:49 |
| 11M22072 | WG633034-02 20ug/L LCS2 624      | NA | 2   | 1    | STD84267  | 10/07/17 00:18 |
| 11M22073 | RINSE                            | NA | 2   | 1    |           | 10/07/17 00:48 |
| 11M22074 | WG633034-03 BLANK 624            | NA | 2   | 1    |           | 10/07/17 01:18 |
| 11M22075 | L17100445-02 A 624-SPE1          | 7  | 2   | 1    |           | 10/07/17 01:47 |
| 11M22076 | L17100445-04 A 624-SPE1          | 7  | 2   | 1    |           | 10/07/17 02:17 |
| 11M22077 | L17100445-06 A 624-SPE1          | 7  | 2   | 1    |           | 10/07/17 02:46 |

Approved: October 10, 2017

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## Microbac Laboratories Inc.

## Instrument Run Log

|             |                    |           |                   |
|-------------|--------------------|-----------|-------------------|
| Instrument: | HPMS11             | Dataset:  | 100617            |
| Analyst1:   | JDS                | Analyst2: | NA                |
| Method:     | 8260               | SOP:      | MSV01, OVAP MSV01 |
| Method:     | 5035, 5030B, 5030C | SOP:      | PAT01, OVAP PAT01 |
|             |                    | Rev:      | 25,0              |
|             |                    | Rev:      | 19,1              |

Maintenance Log ID: \_\_\_\_\_

|                               |                              |
|-------------------------------|------------------------------|
| Internal Standard: STD83895   | Surrogate Standard: STD83896 |
| CCV: STD84160                 | LCS: STD84177                |
| Column 1 ID: RTX502.2         | Column 2 ID: NA              |
| Workgroups: WG632950 WG633034 |                              |

Comments: Alt. Src. failed low for Diox. and high for acrolein. The following will need to RR due to low failing Diox. in Alt. Src.:1703-01, 02, 03, 04

| File ID  | Sample Information        | pH | Mat | Dil | Reference | Date/Time      |
|----------|---------------------------|----|-----|-----|-----------|----------------|
| 11M22078 | L17100409-13 A 624-SPE    | 7  | 2   | 1   |           | 10/07/17 03:16 |
| 11M22079 | L17100409-14 A 624-SPE    | 7  | 2   | 1   |           | 10/07/17 03:46 |
| 11M22080 | L17100409-15 A 624-SPE    | 7  | 2   | 1   |           | 10/07/17 04:16 |
| 11M22081 | L17100409-16 A 624-SPE    | 7  | 2   | 1   |           | 10/07/17 04:46 |
| 11M22082 | L17100401-01 A 5X 624-SPE | <2 | 2   | 5   |           | 10/07/17 05:16 |
| 11M22083 | L17100403-01 A 624-SPE    | <2 | 2   | 1   |           | 10/07/17 05:45 |
| 11M22084 | L17100403-02 A 624-SPE    | <2 | 2   | 1   |           | 10/07/17 06:15 |
| 11M22085 | L17100403-03 A 624-SPE    | <2 | 2   | 1   |           | 10/07/17 06:45 |
| 11M22086 | L17100404-01 A 624-SPE    | <2 | 2   | 1   |           | 10/07/17 07:15 |
| 11M22087 | L17100404-02 A 624-SPE    | <2 | 2   | 1   |           | 10/07/17 07:44 |
| 11M22088 | L17100404-03 A 624-SPE    | <2 | 2   | 1   |           | 10/07/17 08:14 |
| 11M22089 | L17100342-01 B 624-SPE    | 6  | 2   | 1   |           | 10/07/17 08:44 |
| 11M22090 | L17100440-01 A 624-SPE    | 9  | 2   | 1   |           | 10/07/17 09:14 |
| 11M22091 | L17100444-01 A 624-SPE    | 7  | 2   | 1   |           | 10/07/17 09:44 |
| 11M22092 | CCV                       | NA | 2   | 1   |           | 10/07/17 10:14 |
| 11M22093 | RINSE                     | NA | 2   | 1   |           | 10/07/17 10:43 |
| 11M22094 | RINSE                     | NA | 2   | 1   |           | 10/07/17 11:13 |
| 11M22095 | RINSE                     | NA | 2   | 1   |           | 10/07/17 11:43 |

Comments

| Seq.              | Rerun | Dil. | Reason              | Analytes |
|-------------------|-------|------|---------------------|----------|
| 38                | X     | 2    | Analyzed too dilute |          |
| File ID: 11M22082 |       |      |                     |          |
| L17100401-01      |       |      |                     |          |

Approved: October 10, 2017

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## Microbac Laboratories Inc.

## Data Checklist

Date: 22-JUN-2017

Analyst: JDS

Analyst: NA

Method: 8260/624

Instrument: HPMS11

Curve Workgroup: NA

Runlog ID: 82939

Analytical Workgroups: WG618911

|  |     |
|--|-----|
| System Performance Check   |     |
| BFB  | NA  |
| Initial Calibration  |     |
| Average RF   | X   |
| Linear Reg or Higher Order Curve                                   | X   |
| Second Source standard % Difference                                | X   |
| Continuing Calibration /Check Standards                            | X   |
| Project/Client Specific Requirements                               | X   |
| Special Standards  | NA  |
| Blanks   | X   |
| TCL's  | X   |
| Surrogates   | X   |
| LCS (Laboratory Control Sample)                                    | X   |
| Recoveries   | X   |
| Surrogates   | X   |
| MS/MSD/Duplicates  | NA  |
| Samples  | X   |
| TCL Hits   | X   |
| Spectra of TCL Hits  | JDS |
| Surrogates   | X   |
| Internal Standards Criteria  | X   |
| Library Searches   | NA  |
| Calculations & Correct Factors                                     | X   |
| Dilutions Run  | NA  |
| Reruns   | NA  |
| Manual Integrations  | NA  |
| Case Narrative   | X   |
| Results Reporting/Data Qualifiers                                  | X   |
| KOBRA Workgroup Data   | X   |
| Check for Completeness   | X   |
| Primary Reviewer   | JDS |
| Secondary Reviewer   | SAV |
|  |     |
| Check for compliance with method and project specific requirements |     |
| Check the completeness of reported information                     | X   |
| Check the information for the report narrative                     | X   |
| Check the reasonableness of the results                            | X   |

Primary Reviewer:  
23-JUN-2017Secondary Reviewer:  
23-JUN-2017

## Microbac Laboratories Inc.

## Data Checklist

Date: 02-OCT-2017

Analyst: JDS

Analyst: NA

Method: 8260

Instrument: HPMS11

Curve Workgroup: NA

Runlog ID: 85043

Analytical Workgroups: WG632177 (ICAL)

|  |     |
|--|-----|
| System Performance Check   | X   |
| BFB  | X   |
| Initial Calibration  | X   |
| Average RF   | X   |
| Linear Reg or Higher Order Curve                                   | X   |
| Second Source standard % Difference                                | X   |
| Continuing Calibration /Check Standards                            | NA  |
| Project/Client Specific Requirements                               | X   |
| Special Standards  | NA  |
| Blanks   | NA  |
| TCL's  | X   |
| Surrogates   | X   |
| LCS (Laboratory Control Sample)                                    | NA  |
| Recoveries   | X   |
| Surrogates   | X   |
| MS/MSD/Duplicates  | NA  |
| Samples  | NA  |
| TCL Hits   | X   |
| Spectra of TCL Hits  | JDS |
| Surrogates   | X   |
| Internal Standards Criteria  | X   |
| Library Searches   | NA  |
| Calculations & Correct Factors                                     | X   |
| Dilutions Run  | NA  |
| Reruns   | NA  |
| Manual Integrations  | NA  |
| Case Narrative   | NA  |
| Results Reporting/Data Qualifiers                                  | X   |
| KOBRA Workgroup Data   | X   |
| Check for Completeness   | X   |
| Primary Reviewer   | JDS |
| Secondary Reviewer   | ADC |
|  |     |
| Check for compliance with method and project specific requirements | X   |
| Check the completeness of reported information                     | X   |
| Check the information for the report narrative                     | X   |
| Check the reasonableness of the results                            | X   |

Primary Reviewer:  
04-OCT-2017Secondary Reviewer:  
05-OCT-2017

## Microbac Laboratories Inc.

## Data Checklist

Date: 03-OCT-2017

Analyst: JDS

Analyst: NA

Method: 8260

Instrument: HPMS11

Curve Workgroup: NA

Runlog ID: 85044

Analytical Workgroups: WG632394

|  |     |
|--|-----|
| System Performance Check   | X   |
| BFB  | X   |
| Initial Calibration  | X   |
| Average RF   | X   |
| Linear Reg or Higher Order Curve                                   | X   |
| Second Source standard % Difference                                | X   |
| Continuing Calibration /Check Standards                            | X   |
| Project/Client Specific Requirements                               | X   |
| Special Standards  | NA  |
| Blanks   | X   |
| TCL's  | X   |
| Surrogates   | X   |
| LCS (Laboratory Control Sample)                                    | X   |
| Recoveries   | X   |
| Surrogates   | X   |
| MS/MSD/Duplicates  | X   |
| Samples  | X   |
| TCL Hits   | X   |
| Spectra of TCL Hits  | JDS |
| Surrogates   | X   |
| Internal Standards Criteria  | X   |
| Library Searches   | NA  |
| Calculations & Correct Factors                                     | X   |
| Dilutions Run  | NA  |
| Reruns   | X   |
| Manual Integrations  | NA  |
| Case Narrative   | X   |
| Results Reporting/Data Qualifiers                                  | X   |
| KOBRA Workgroup Data   | X   |
| Check for Completeness   | X   |
| Primary Reviewer   | JDS |
| Secondary Reviewer   | SAV |
|  |     |
| Check for compliance with method and project specific requirements | X   |
| Check the completeness of reported information                     | X   |
| Check the information for the report narrative                     | X   |
| Check the reasonableness of the results                            | X   |

Primary Reviewer:  
05-OCT-2017Secondary Reviewer:  
05-OCT-2017

## Microbac Laboratories Inc.

## Data Checklist

Date: 06-OCT-2017

Analyst: JDS

Analyst: NA

Method: 8260

Instrument: HPMS11

Curve Workgroup: NA

Runlog ID: 85114

Analytical Workgroups: WG632950 WG633034

|  |     |
|--|-----|
| System Performance Check   | X   |
| BFB  | X   |
| Initial Calibration  | X   |
| Average RF   | X   |
| Linear Reg or Higher Order Curve                                   | X   |
| Second Source standard % Difference                                | X   |
| Continuing Calibration /Check Standards                            | X   |
| Project/Client Specific Requirements                               | X   |
| Special Standards  | NA  |
| Blanks   | X   |
| TCL's  | X   |
| Surrogates   | X   |
| LCS (Laboratory Control Sample)                                    | X   |
| Recoveries   | X   |
| Surrogates   | X   |
| MS/MSD/Duplicates  | X   |
| Samples  | X   |
| TCL Hits   | X   |
| Spectra of TCL Hits  | HRF |
| Surrogates   | X   |
| Internal Standards Criteria  | X   |
| Library Searches   | NA  |
| Calculations & Correct Factors                                     | X   |
| Dilutions Run  | X   |
| Reruns   | X   |
| Manual Integrations  | NA  |
| Case Narrative   | X   |
| Results Reporting/Data Qualifiers                                  | X   |
| KOBRA Workgroup Data   | X   |
| Check for Completeness   | X   |
| Primary Reviewer   | JDS |
| Secondary Reviewer   | ADC |
|  |     |
| Check for compliance with method and project specific requirements | X   |
| Check the completeness of reported information                     | X   |
| Check the information for the report narrative                     | X   |
| Check the reasonableness of the results                            | X   |

Primary Reviewer:  
10-OCT-2017Secondary Reviewer:  
10-OCT-2017

Microbac Laboratories Inc.  
HOLDING TIMES  
EQUIVALENT TO AFCEE FORM 9

Analytical Method: 8260B  
Login Number: L17100037

AAB#: WG632950

| Client ID      | ID | Date Collected | TCLP Date | Time Held | Max Hold | Q | Extract Date | Time Held | Max Hold | Q | Run Date | Time Held | Max Hold | Q |
|----------------|----|----------------|-----------|-----------|----------|---|--------------|-----------|----------|---|----------|-----------|----------|---|
| EB01-092817    | 01 | 09/28/17       |           |           |          |   | 10/06/2017   | 8.3       | 14       |   | 10/06/17 | 8.3       | 14       |   |
| 0306-PW-092817 | 02 | 09/28/17       |           |           |          |   | 10/06/2017   | 8.3       | 14       |   | 10/06/17 | 8.3       | 14       |   |
| 0315-PW-092817 | 03 | 09/28/17       |           |           |          |   | 10/06/2017   | 8.3       | 14       |   | 10/06/17 | 8.3       | 14       |   |
| 0309-PW-092817 | 04 | 09/28/17       |           |           |          |   | 10/06/2017   | 8.3       | 14       |   | 10/06/17 | 8.3       | 14       |   |
| 0310-PW-092817 | 05 | 09/28/17       |           |           |          |   | 10/06/2017   | 8.2       | 14       |   | 10/06/17 | 8.2       | 14       |   |
| 0311-PW-092817 | 06 | 09/28/17       |           |           |          |   | 10/06/2017   | 8.2       | 14       |   | 10/06/17 | 8.2       | 14       |   |
| TB01-092817    | 07 | 09/28/17       |           |           |          |   | 10/06/2017   | 7.9       | 14       |   | 10/06/17 | 7.9       | 14       |   |

\* = SEE PROJECT QAPP REQUIREMENTS

HOLD\_TIMES - Modified 03/06/2008  
PDF File ID: 5518891  
Report generated 10/10/2017 08:46



Microbac Laboratories Inc.  
SURROGATE STANDARDS

Login Number:L17100037  
Instrument Id:HPMS11  
Workgroup (AAB#):WG632950

Method:8260  
CAL ID: HPMS11 - 02-OCT-17  
Matrix:Water

| Sample Number | Dilution | Tag | 1    | 2    | 3    | 4    |
|---------------|----------|-----|------|------|------|------|
| L17100037-01  | 1.00     | 01  | 91.2 | 95.5 | 103  | 97.5 |
| L17100037-02  | 1.00     | 01  | 90.4 | 91.5 | 97.7 | 94.2 |
| L17100037-03  | 1.00     | 01  | 89.8 | 94.0 | 103  | 94.2 |
| L17100037-04  | 1.00     | 01  | 88.7 | 91.0 | 100  | 94.1 |
| L17100037-05  | 1.00     | 01  | 87.3 | 89.1 | 98.6 | 91.9 |
| L17100037-06  | 1.00     | 01  | 90.9 | 93.7 | 104  | 93.4 |
| L17100037-07  | 1.00     | 01  | 88.5 | 93.9 | 102  | 95.5 |
| WG632950-01   | 1.00     | 01  | 88.3 | 89.8 | 104  | 93.6 |
| WG632950-02   | 1.00     | 01  | 88.3 | 93.5 | 102  | 95.7 |

| Surrogates                | Surrogate Limits |   |     |
|---------------------------|------------------|---|-----|
| 1 - 1,2-Dichloroethane-d4 | 70               | - | 120 |
| 2 - Dibromofluoromethane  | 85               | - | 115 |
| 3 - 4-Bromofluorobenzene  | 75               | - | 120 |
| 4 - Toluene-d8            | 85               | - | 120 |

Underline = Result out of surrogate limits

DL = surrogate diluted out

ND = surrogate not detected

SURROGATES - Modified 03/06/2008  
PDF File ID: 5518900  
Report generated: 10/10/2017 08:46



## METHOD BLANK SUMMARY

Login Number:L17100037 Work Group:WG632950  
 Blank File ID:11M22048 Blank Sample ID:WG632950-01  
 Prep Date:10/06/17 12:34 Instrument ID:HPMS11  
 Analyzed Date:10/06/17 12:34 Method:8260B  
 Analyst:JDS

This Method Blank Applies To The Following Samples:

| Client ID      | Lab Sample ID | Lab File ID | Time Analyzed  | TAG |
|----------------|---------------|-------------|----------------|-----|
| LCS            | WG632950-02   | 11M22049    | 10/06/17 13:04 | 01  |
| TB01-092817    | L17100037-07  | 11M22053    | 10/06/17 15:01 | 01  |
| EB01-092817    | L17100037-01  | 11M22056    | 10/06/17 16:29 | 01  |
| 0306-PW-092817 | L17100037-02  | 11M22063    | 10/06/17 19:54 | 01  |
| 0315-PW-092817 | L17100037-03  | 11M22064    | 10/06/17 20:23 | 01  |
| 0309-PW-092817 | L17100037-04  | 11M22065    | 10/06/17 20:52 | 01  |
| 0310-PW-092817 | L17100037-05  | 11M22066    | 10/06/17 21:22 | 01  |
| 0311-PW-092817 | L17100037-06  | 11M22067    | 10/06/17 21:52 | 01  |

Report Name: BLANK\_SUMMARY  
 PDF File ID: 5518892  
 Report generated 10/10/2017 08:46



## Microbac Laboratories Inc.

## METHOD BLANK REPORT

Login Number:L17100037 Prep Date:10/06/17 12:34 Sample ID:WG632950-01  
 Instrument ID:HPMS11 Run Date:10/06/17 12:34 Prep Method:5030B/5030C/503  
 File ID:11M22048 Analyst:JDS Method:8260B  
 Workgroup (AAB#):WG632950 Matrix:Water Units:ug/L  
 Contract #: \_\_\_\_\_ Cal ID:HPMS11-02-OCT-17

| Analytes                  | MDL   | RL   | Concentration | Dilution | Qualifier |
|---------------------------|-------|------|---------------|----------|-----------|
| 1,1,2,2-Tetrachloroethane | 0.200 | 1.00 | 1.00          | 1        | U         |
| 1,1,2-Trichloroethane     | 0.250 | 1.00 | 1.00          | 1        | U         |
| 1,1-Dichloroethane        | 0.125 | 1.00 | 1.00          | 1        | U         |
| 1,1-Dichloroethene        | 0.500 | 1.00 | 1.00          | 1        | U         |
| 1,2-Dichloroethane        | 0.250 | 1.00 | 1.00          | 1        | U         |
| 1,2-Dichloropropane       | 0.200 | 1.00 | 1.00          | 1        | U         |
| 1,2,4-Trimethylbenzene    | 0.250 | 1.00 | 1.00          | 1        | U         |
| 1,4-Dichlorobenzene       | 0.125 | 1.00 | 1.00          | 1        | U         |
| 1,3,5-Trimethylbenzene    | 0.250 | 1.00 | 1.00          | 1        | U         |
| 1,3-Dichlorobenzene       | 0.250 | 1.00 | 1.00          | 1        | U         |
| 2-Butanone                | 2.50  | 5.00 | 5.00          | 1        | U         |
| 4-Methyl-2-pentanone      | 2.50  | 5.00 | 5.00          | 1        | U         |
| Acetone                   | 2.50  | 5.00 | 5.00          | 1        | U         |
| 2-Hexanone                | 2.50  | 5.00 | 5.00          | 1        | U         |
| Benzene                   | 0.125 | 1.00 | 1.00          | 1        | U         |
| Bromodichloromethane      | 0.250 | 1.00 | 1.00          | 1        | U         |
| Bromomethane              | 0.500 | 1.00 | 1.00          | 1        | U         |
| Carbon disulfide          | 0.500 | 1.00 | 1.00          | 1        | U         |
| Carbon tetrachloride      | 0.250 | 1.00 | 1.00          | 1        | U         |
| Chlorobenzene             | 0.125 | 1.00 | 1.00          | 1        | U         |
| Chloroform                | 0.125 | 1.00 | 1.00          | 1        | U         |
| Dibromochloromethane      | 0.250 | 1.00 | 1.00          | 1        | U         |
| Dichlorodifluoromethane   | 0.250 | 1.00 | 1.00          | 1        | U         |
| Chloromethane             | 0.500 | 1.00 | 1.00          | 1        | U         |
| cis-1,2-Dichloroethene    | 0.250 | 1.00 | 1.00          | 1        | U         |
| Diethyl ether             | 5.00  | 10.0 | 10.0          | 1        | U         |
| Ethylbenzene              | 0.250 | 1.00 | 1.00          | 1        | U         |
| Methylene chloride        | 0.250 | 1.00 | 1.00          | 1        | U         |
| Naphthalene               | 0.200 | 1.00 | 1.00          | 1        | U         |
| Styrene                   | 0.125 | 1.00 | 1.00          | 1        | U         |
| Tetrachloroethene         | 0.250 | 1.00 | 1.00          | 1        | U         |
| Toluene                   | 0.250 | 1.00 | 1.00          | 1        | U         |
| trans-1,2-Dichloroethene  | 0.250 | 1.00 | 1.00          | 1        | U         |
| Trichloroethene           | 0.250 | 1.00 | 1.00          | 1        | U         |
| Trichlorofluoromethane    | 0.250 | 1.00 | 1.00          | 1        | U         |
| Vinyl chloride            | 0.250 | 1.00 | 1.00          | 1        | U         |
| Xylenes                   | 0.500 | 1.00 | 1.00          | 1        | U         |

Report Name:BLANK  
 PDF ID: 5518893  
 10-OCT-2017 08:46



Microbac Laboratories Inc.  
METHOD BLANK REPORT

Login Number:L17100037 Prep Date:10/06/17 12:34 Sample ID:WG632950-01  
Instrument ID:HPMS11 Run Date:10/06/17 12:34 Prep Method:5030B/5030C/503  
File ID:11M22048 Analyst:JDS Method:8260B  
Workgroup (AAB#):WG632950 Matrix:Water Units:ug/L  
Contract #: \_\_\_\_\_ Cal ID:HPMS11-02-OCT-17

| Surrogates            | % Recovery | Surrogate Limits |   | Qualifier |      |
|-----------------------|------------|------------------|---|-----------|------|
| 1,2-Dichloroethane-d4 | 88.3       | 70               | - | 120       | PASS |
| 4-Bromofluorobenzene  | 104        | 75               | - | 120       | PASS |
| Dibromofluoromethane  | 89.8       | 85               | - | 115       | PASS |
| Toluene-d8            | 93.6       | 85               | - | 120       | PASS |

MDL Method Detection Limit

RL Reporting/Practical Quantitation Limit

ND Analyte Not detected at or above reporting limit

\* |Analyte concentration| > RL

Report Name:BLANK  
PDF ID: 5518893  
10-OCT-2017 08:46



Microbac Laboratories Inc.  
LABORATORY CONTROL SAMPLE (LCS)

Login Number:L17100037 Run Date:10/06/2017 Sample ID:WG632950-02  
 Instrument ID:HPMS11 Run Time:13:04 Prep Method:5030B/5030C/503  
 File ID:11M22049 Analyst:JDS Method:8260B  
 Workgroup (AAB#):WG632950 Matrix:Water Units:ug/L  
 QC Key:DOWWVO2012 Lot#:STD84177 Cal ID:HPMS11-02-OCT-17

| Analytes                  | Expected | Found | % Rec | LCS Limits | Q |
|---------------------------|----------|-------|-------|------------|---|
| 1,1,2,2-Tetrachloroethane | 20.0     | 21.8  | 109   | 65 - 130   |   |
| 1,1,2-Trichloroethane     | 20.0     | 20.6  | 103   | 75 - 125   |   |
| 1,1-Dichloroethane        | 20.0     | 19.9  | 99.7  | 70 - 135   |   |
| 1,1-Dichloroethene        | 20.0     | 21.1  | 105   | 70 - 130   |   |
| 1,2-Dichloroethane        | 20.0     | 20.4  | 102   | 70 - 130   |   |
| 1,2-Dichloropropane       | 20.0     | 20.7  | 104   | 75 - 125   |   |
| 1,2,4-Trimethylbenzene    | 20.0     | 23.2  | 116   | 75 - 130   |   |
| 1,4-Dichlorobenzene       | 20.0     | 21.8  | 109   | 75 - 125   |   |
| 1,3,5-Trimethylbenzene    | 20.0     | 24.4  | 122   | 75 - 130   |   |
| 1,3-Dichlorobenzene       | 20.0     | 21.8  | 109   | 75 - 125   |   |
| 2-Butanone                | 20.0     | 19.3  | 96.6  | 30 - 150   |   |
| 4-Methyl-2-pentanone      | 20.0     | 19.2  | 96.0  | 60 - 135   |   |
| Acetone                   | 20.0     | 18.9  | 94.5  | 40 - 140   |   |
| 2-Hexanone                | 20.0     | 21.2  | 106   | 55 - 130   |   |
| Benzene                   | 20.0     | 19.7  | 98.4  | 80 - 120   |   |
| Bromodichloromethane      | 20.0     | 20.0  | 100   | 75 - 120   |   |
| Bromomethane              | 20.0     | 19.5  | 97.5  | 30 - 145   |   |
| Carbon disulfide          | 20.0     | 16.8  | 84.1  | 35 - 160   |   |
| Carbon tetrachloride      | 20.0     | 20.3  | 102   | 65 - 140   |   |
| Chlorobenzene             | 20.0     | 21.4  | 107   | 80 - 120   |   |
| Chloroform                | 20.0     | 21.0  | 105   | 65 - 135   |   |
| Dibromochloromethane      | 20.0     | 20.9  | 104   | 60 - 135   |   |
| Dichlorodifluoromethane   | 20.0     | 16.3  | 81.6  | 30 - 155   |   |
| Chloromethane             | 20.0     | 17.8  | 89.2  | 40 - 125   |   |
| cis-1,2-Dichloroethene    | 20.0     | 20.5  | 103   | 70 - 125   |   |
| Diethyl ether             | 100      | 97.0  | 97.0  | 70 - 130   |   |
| Ethylbenzene              | 20.0     | 21.5  | 107   | 75 - 125   |   |
| Methylene chloride        | 20.0     | 19.1  | 95.4  | 55 - 140   |   |
| Naphthalene               | 20.0     | 25.9  | 129   | 55 - 140   |   |
| Styrene                   | 20.0     | 22.9  | 115   | 65 - 135   |   |
| Tetrachloroethene         | 20.0     | 20.8  | 104   | 45 - 150   |   |
| Toluene                   | 20.0     | 20.9  | 105   | 75 - 120   |   |
| trans-1,2-Dichloroethene  | 20.0     | 21.0  | 105   | 60 - 140   |   |
| Trichloroethene           | 20.0     | 21.3  | 107   | 70 - 125   |   |
| Trichlorofluoromethane    | 20.0     | 19.9  | 99.3  | 60 - 145   |   |
| Vinyl chloride            | 20.0     | 22.5  | 113   | 50 - 145   |   |
| Xylenes                   | 60.0     | 67.9  | 113   | 70 - 130   |   |

LCS - Modified 03/06/2008  
 PDF File ID: 5518894  
 Report generated: 10/10/2017 08:46



Microbac Laboratories Inc.  
LABORATORY CONTROL SAMPLE (LCS)

Login Number:L17100037 Run Date:10/06/2017 Sample ID:WG632950-02  
Instrument ID:HPMS11 Run Time:13:04 Prep Method:5030B/5030C/503  
File ID:11M22049 Analyst:JDS Method:8260B  
Workgroup (AAB#):WG632950 Matrix:Water Units:ug/L  
QC Key:DOWWVO2012 Lot#:STD84177 Cal ID:HPMS11-02-OCT-17

| Surrogates            | % Recovery | Surrogate Limits |   | Qualifier |      |
|-----------------------|------------|------------------|---|-----------|------|
| 1,2-Dichloroethane-d4 | 88.3       | 70               | - | 120       | PASS |
| 4-Bromofluorobenzene  | 102        | 75               | - | 120       | PASS |
| Dibromofluoromethane  | 93.5       | 85               | - | 115       | PASS |
| Toluene-d8            | 95.7       | 85               | - | 120       | PASS |

\* EXCEEDS %REC LIMIT

LCS - Modified 03/06/2008  
PDF File ID: 5518894  
Report generated: 10/10/2017 08:46



Loginnum:L17100037  
 Instrument ID:HPMS11  
 Parent ID:WG632950-03  
 Sample ID:WG632950-04 MS  
 Sample ID:WG632950-05 MSD

Cal ID: HPMS11-  
 Contract #: File ID:11M22060 Dil:1  
 File ID:11M22050 Dil:1  
 File ID:11M22051 Dil:1

Worknum: WG632950  
 Method:8260B  
 Matrix:WATER  
 Units:ug/L

| Analyte                   | Parent | MS Spiked | MS Found | MS %Rec | MSD Spiked | MSD Found | MSD %Rec | %RPD  | %Rec Limits | RPD Limit | Q |
|---------------------------|--------|-----------|----------|---------|------------|-----------|----------|-------|-------------|-----------|---|
| 1,1,2,2-Tetrachloroethane | ND     | 20.0      | 21.7     | 109     | 20.0       | 23.2      | 116      | 6.53  | 65 - 130    | 20        |   |
| 1,1,2-Trichloroethane     | ND     | 20.0      | 19.9     | 99.3    | 20.0       | 21.2      | 106      | 6.39  | 75 - 125    | 20        |   |
| 1,1-Dichloroethane        | 0.192  | 20.0      | 19.3     | 95.5    | 20.0       | 20.3      | 101      | 5.22  | 70 - 135    | 20        |   |
| 1,1-Dichloroethene        | ND     | 20.0      | 20.0     | 100     | 20.0       | 20.9      | 104      | 4.27  | 70 - 130    | 20        |   |
| 1,2,4-Trimethylbenzene    | ND     | 20.0      | 22.3     | 112     | 20.0       | 23.9      | 119      | 6.65  | 75 - 130    | 20        |   |
| 1,2-Dichloroethane        | ND     | 20.0      | 19.8     | 99.2    | 20.0       | 20.6      | 103      | 3.94  | 70 - 130    | 20        |   |
| 1,2-Dichloropropane       | ND     | 20.0      | 20.2     | 101     | 20.0       | 20.9      | 105      | 3.76  | 75 - 125    | 20        |   |
| 1,3,5-Trimethylbenzene    | ND     | 20.0      | 23.5     | 118     | 20.0       | 25.4      | 127      | 7.75  | 75 - 130    | 20        |   |
| 1,3-Dichlorobenzene       | ND     | 20.0      | 21.3     | 107     | 20.0       | 22.6      | 113      | 5.86  | 75 - 125    | 20        |   |
| 1,4-Dichlorobenzene       | ND     | 20.0      | 21.7     | 109     | 20.0       | 22.8      | 114      | 4.68  | 75 - 125    | 20        |   |
| 2-Butanone                | ND     | 20.0      | 18.3     | 91.7    | 20.0       | 20.0      | 100      | 8.81  | 30 - 150    | 20        |   |
| 2-Hexanone                | ND     | 20.0      | 20.5     | 103     | 20.0       | 21.9      | 110      | 6.65  | 55 - 130    | 20        |   |
| 4-Methyl-2-pentanone      | ND     | 20.0      | 18.9     | 94.4    | 20.0       | 19.7      | 98.4     | 4.08  | 60 - 135    | 20        |   |
| Acetone                   | ND     | 20.0      | 18.2     | 91.2    | 20.0       | 19.7      | 98.5     | 7.73  | 40 - 140    | 20        |   |
| Benzene                   | ND     | 20.0      | 19.2     | 96.2    | 20.0       | 19.9      | 99.7     | 3.59  | 80 - 120    | 20        |   |
| Bromodichloromethane      | ND     | 20.0      | 19.8     | 99.0    | 20.0       | 20.9      | 104      | 5.36  | 75 - 120    | 20        |   |
| Bromomethane              | ND     | 20.0      | 18.9     | 94.7    | 20.0       | 19.4      | 97.1     | 2.47  | 30 - 145    | 20        |   |
| Carbon disulfide          | ND     | 20.0      | 16.2     | 81.0    | 20.0       | 16.6      | 83.1     | 2.49  | 35 - 160    | 20        |   |
| Carbon tetrachloride      | ND     | 20.0      | 19.2     | 96.1    | 20.0       | 20.3      | 101      | 5.41  | 65 - 140    | 20        |   |
| Chlorobenzene             | ND     | 20.0      | 20.3     | 102     | 20.0       | 21.5      | 108      | 5.72  | 80 - 120    | 20        |   |
| Chloroform                | ND     | 20.0      | 20.2     | 101     | 20.0       | 20.9      | 105      | 3.53  | 65 - 135    | 20        |   |
| Chloromethane             | ND     | 20.0      | 16.7     | 83.6    | 20.0       | 17.3      | 86.6     | 3.49  | 40 - 125    | 20        |   |
| Dibromochloromethane      | ND     | 20.0      | 19.8     | 99.1    | 20.0       | 21.1      | 105      | 6.15  | 60 - 135    | 20        |   |
| Dichlorodifluoromethane   | ND     | 20.0      | 16.0     | 79.8    | 20.0       | 15.8      | 78.9     | 1.14  | 30 - 155    | 20        |   |
| Diethyl ether             | ND     | 100       | 95.5     | 95.5    | 100        | 101       | 101      | 5.20  | 70 - 130    | 20        |   |
| Ethylbenzene              | ND     | 20.0      | 20.5     | 102     | 20.0       | 21.5      | 107      | 4.90  | 75 - 125    | 20        |   |
| Methylene chloride        | ND     | 20.0      | 18.4     | 92.1    | 20.0       | 19.6      | 97.8     | 5.96  | 55 - 140    | 20        |   |
| Naphthalene               | ND     | 20.0      | 25.8     | 129     | 20.0       | 27.7      | 139      | 6.98  | 55 - 140    | 20        |   |
| Styrene                   | ND     | 20.0      | 22.0     | 110     | 20.0       | 23.3      | 116      | 5.59  | 65 - 135    | 20        |   |
| Tetrachloroethene         | ND     | 20.0      | 19.9     | 99.4    | 20.0       | 21.0      | 105      | 5.50  | 45 - 150    | 20        |   |
| Toluene                   | ND     | 20.0      | 19.8     | 98.9    | 20.0       | 21.1      | 106      | 6.58  | 75 - 120    | 20        |   |
| Trichloroethene           | 0.542  | 20.0      | 20.5     | 99.9    | 20.0       | 21.5      | 105      | 4.86  | 70 - 125    | 20        |   |
| Trichlorofluoromethane    | ND     | 20.0      | 18.7     | 93.6    | 20.0       | 19.3      | 96.7     | 3.24  | 60 - 145    | 20        |   |
| Vinyl chloride            | ND     | 20.0      | 19.7     | 98.5    | 20.0       | 19.6      | 97.8     | 0.648 | 50 - 145    | 20        |   |
| Xylenes                   | ND     | 60.0      | 64.5     | 107     | 60.0       | 69.1      | 115      | 6.89  | 70 - 130    | 20        |   |
| cis-1,2-Dichloroethene    | ND     | 20.0      | 20.0     | 99.9    | 20.0       | 20.6      | 103      | 3.02  | 70 - 125    | 20        |   |
| trans-1,2-Dichloroethene  | ND     | 20.0      | 20.5     | 103     | 20.0       | 21.1      | 106      | 2.99  | 60 - 140    | 20        |   |

WG\_MS\_MSD\_DRYWT - Modified 05/26/2011  
 PDF File ID: 5518895  
 Report generated 10/10/2017 08:46



Microbac Laboratories Inc.  
MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

\* FAILS %REC LIMIT

# FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

WG\_MS\_MSD\_DRYWT - Modified 05/26/2011  
PDF File ID: 5518895  
Report generated 10/10/2017 08:46



Microbac Laboratories Inc.  
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L17100037  
Instrument: HPMs11  
Analyst: JDS  
Workgroup: WG618910

Tune ID: WG618910-01  
Run Date: 06/22/2017  
Run Time: 11:03  
File ID: 11M19216  
Cal ID: HPMs11 - 20-JUN-17

| Target Mass | Rel. to Mass | Lower Limit% | Upper Limit% | Rel. Abn% | Raw Abn | Result Pass/Fail |
|-------------|--------------|--------------|--------------|-----------|---------|------------------|
| 50.0        | 95.0         | 15.0         | 40.0         | 18.6      | 11528   | PASS             |
| 75.0        | 95.0         | 30.0         | 60.0         | 50.7      | 31472   | PASS             |
| 95.0        | 95.0         | 100          | 100          | 100       | 62029   | PASS             |
| 96.0        | 95.0         | 5.00         | 9.00         | 6.75      | 4187    | PASS             |
| 173         | 174          | 0            | 2.00         | 0         | 0       | PASS             |
| 174         | 95.0         | 50.0         | 100          | 76.9      | 47690   | PASS             |
| 175         | 174          | 5.00         | 9.00         | 7.92      | 3778    | PASS             |
| 176         | 174          | 95.0         | 101          | 96.2      | 45858   | PASS             |
| 177         | 176          | 5.00         | 9.00         | 6.64      | 3043    | PASS             |

This check relates to the following samples:

| Lab ID      | Client ID | Tag | Date Analyzed    | Q |
|-------------|-----------|-----|------------------|---|
| WG618912-01 | STD       | 01  | 06/22/2017 12:32 |   |
| WG618912-02 | STD       | 01  | 06/22/2017 13:02 |   |
| WG618912-03 | STD       | 01  | 06/22/2017 13:31 |   |
| WG618912-04 | STD-CCV   | 01  | 06/22/2017 14:01 |   |
| WG618912-05 | STD       | 01  | 06/22/2017 14:31 |   |
| WG618912-06 | STD       | 01  | 06/22/2017 14:59 |   |
| WG618912-07 | STD       | 01  | 06/22/2017 15:29 |   |
| WG618912-08 | STD       | 01  | 06/22/2017 15:58 |   |
| WG618912-09 | STD       | 01  | 06/22/2017 16:57 |   |

\* Sample past 12 hour tune limit

TUNE - Modified 03/06/2008  
PDF File ID: 5518897  
Report generated 10/10/2017 08:46



Microbac Laboratories Inc.  
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L17100037  
Instrument: HPMS11  
Analyst: JDS  
Workgroup: WG632177

Tune ID: WG632177-01  
Run Date: 10/02/2017  
Run Time: 14:54  
File ID: 11M21910  
Cal ID: HPMS11 -

| Target Mass | Rel. to Mass | Lower Limit% | Upper Limit% | Rel. Abn% | Raw Abn | Result Pass/Fail |
|-------------|--------------|--------------|--------------|-----------|---------|------------------|
| 50.0        | 95.0         | 15.0         | 40.0         | 23.2      | 11473   | PASS             |
| 75.0        | 95.0         | 30.0         | 60.0         | 53.1      | 26245   | PASS             |
| 95.0        | 95.0         | 100          | 100          | 100       | 49448   | PASS             |
| 96.0        | 95.0         | 5.00         | 9.00         | 7.54      | 3729    | PASS             |
| 173         | 174          | 0            | 2.00         | 0         | 0       | PASS             |
| 174         | 95.0         | 50.0         | 100          | 69.4      | 34333   | PASS             |
| 175         | 174          | 5.00         | 9.00         | 8.57      | 2941    | PASS             |
| 176         | 174          | 95.0         | 101          | 101       | 34648   | PASS             |
| 177         | 176          | 5.00         | 9.00         | 6.66      | 2308    | PASS             |

This check relates to the following samples:

| Lab ID      | Client ID | Tag | Date Analyzed    | Q |
|-------------|-----------|-----|------------------|---|
| WG632177-02 | STD       | 01  | 10/02/2017 16:54 |   |
| WG632177-03 | STD       | 01  | 10/02/2017 19:21 |   |
| WG632177-04 | STD       | 01  | 10/02/2017 19:50 |   |
| WG632177-05 | STD       | 01  | 10/02/2017 20:19 |   |
| WG632177-06 | STD       | 01  | 10/02/2017 20:49 |   |
| WG632177-07 | STD       | 01  | 10/02/2017 21:18 |   |
| WG632177-08 | STD-CCV   | 01  | 10/02/2017 21:47 |   |
| WG632177-09 | STD       | 01  | 10/02/2017 22:16 |   |
| WG632177-10 | STD       | 01  | 10/02/2017 22:46 |   |
| WG632177-11 | STD       | 01  | 10/02/2017 23:16 |   |

\* Sample past 12 hour tune limit

TUNE - Modified 03/06/2008  
PDF File ID: 5518897  
Report generated 10/10/2017 08:46



Microbac Laboratories Inc.  
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L17100037  
Instrument: HPMS11  
Analyst: JDS  
Workgroup: WG632393

Tune ID: WG632393-01  
Run Date: 10/03/2017  
Run Time: 16:41  
File ID: 11M21928  
Cal ID: HPMS11 - 02-OCT-17

| Target Mass | Rel. to Mass | Lower Limit% | Upper Limit% | Rel. Abn% | Raw Abn | Result Pass/Fail |
|-------------|--------------|--------------|--------------|-----------|---------|------------------|
| 50.0        | 95.0         | 15.0         | 40.0         | 22.4      | 13267   | PASS             |
| 75.0        | 95.0         | 30.0         | 60.0         | 52.7      | 31210   | PASS             |
| 95.0        | 95.0         | 100          | 100          | 100       | 59269   | PASS             |
| 96.0        | 95.0         | 5.00         | 9.00         | 6.90      | 4089    | PASS             |
| 173         | 174          | 0            | 2.00         | 0         | 0       | PASS             |
| 174         | 95.0         | 50.0         | 100          | 75.2      | 44570   | PASS             |
| 175         | 174          | 5.00         | 9.00         | 7.66      | 3413    | PASS             |
| 176         | 174          | 95.0         | 101          | 95.1      | 42394   | PASS             |
| 177         | 176          | 5.00         | 9.00         | 7.08      | 3002    | PASS             |

This check relates to the following samples:

| Lab ID      | Client ID | Tag | Date Analyzed    | Q |
|-------------|-----------|-----|------------------|---|
| WG632177-12 | SSCV      | 01  | 10/03/2017 17:38 |   |

\* Sample past 12 hour tune limit

TUNE - Modified 03/06/2008  
PDF File ID: 5518897  
Report generated 10/10/2017 08:46



Microbac Laboratories Inc.  
ORGANIC INSTRUMENT CHECK

BFB

Login Number: L17100037  
Instrument: HPMS11  
Analyst: JDS  
Workgroup: WG632949

Tune ID: WG632949-01  
Run Date: 10/06/2017  
Run Time: 11:09  
File ID: 11M22045  
Cal ID: HPMS11 - 02-OCT-17

| Target Mass | Rel. to Mass | Lower Limit% | Upper Limit% | Rel. Abn% | Raw Abn | Result Pass/Fail |
|-------------|--------------|--------------|--------------|-----------|---------|------------------|
| 50.0        | 95.0         | 15.0         | 40.0         | 23.0      | 10596   | PASS             |
| 75.0        | 95.0         | 30.0         | 60.0         | 55.9      | 25728   | PASS             |
| 95.0        | 95.0         | 100          | 100          | 100       | 46032   | PASS             |
| 96.0        | 95.0         | 5.00         | 9.00         | 6.73      | 3097    | PASS             |
| 173         | 174          | 0            | 2.00         | 0         | 0       | PASS             |
| 174         | 95.0         | 50.0         | 100          | 74.2      | 34133   | PASS             |
| 175         | 174          | 5.00         | 9.00         | 8.94      | 3051    | PASS             |
| 176         | 174          | 95.0         | 101          | 99.1      | 33840   | PASS             |
| 177         | 176          | 5.00         | 9.00         | 6.94      | 2349    | PASS             |

This check relates to the following samples:

| Lab ID       | Client ID      | Tag | Date Analyzed    | Q |
|--------------|----------------|-----|------------------|---|
| WG632949-02  | CCV            | 01  | 10/06/2017 11:33 |   |
| WG632950-01  | BLANK          | 01  | 10/06/2017 12:34 |   |
| WG632950-02  | LCS            | 01  | 10/06/2017 13:04 |   |
| L17100037-07 | TB01-092817    | 01  | 10/06/2017 15:01 |   |
| L17100037-01 | EB01-092817    | 01  | 10/06/2017 16:29 |   |
| L17100037-02 | 0306-PW-092817 | 01  | 10/06/2017 19:54 |   |
| L17100037-03 | 0315-PW-092817 | 01  | 10/06/2017 20:23 |   |
| L17100037-04 | 0309-PW-092817 | 01  | 10/06/2017 20:52 |   |
| L17100037-05 | 0310-PW-092817 | 01  | 10/06/2017 21:22 |   |
| L17100037-06 | 0311-PW-092817 | 01  | 10/06/2017 21:52 |   |

\* Sample past 12 hour tune limit

TUNE - Modified 03/06/2008  
PDF File ID: 5518897  
Report generated 10/10/2017 08:46



## Calibration Table Report

Method: A9FOCWT.M

Title: Appendix IX (SOP:OVL MSV01) Water 062217 HPMS11

Last Calibration: Fri Jun 23 09:50:47 2017

Curve: WG618912

## Calibration Files

|                           | 5          | 20         | 50         | 100        | 200        | 300        | 400        | 500        | Avg    | %RSD   | Linear | Quadratic |
|---------------------------|------------|------------|------------|------------|------------|------------|------------|------------|--------|--------|--------|-----------|
|                           | 11M18218.D | 11M18220.D | 11M18221.D | 11M18222.D | 11M18223.D | 11M18224.D | 11M18225.D | 11M18226.D |        |        |        |           |
| Compound                  |            |            |            |            |            |            |            |            |        |        |        |           |
| I Fluorobenzene           | ISTD       |            |            |            |            |            |            |            |        |        |        |           |
| T Acetonitrile            | 0.036      | 0.036      | 0.034      | 0.036      | 0.037      | 0.037      | 0.035      | 0.035      | 0.036  | 3.063  |        |           |
| T 3-Chloro-1-propene      | 0.486      | 0.499      | 0.493      | 0.472      | 0.427      | 0.395      | 0.358      |            | 0.447  | 12.268 |        |           |
| T 2-Chloro-1,3-butadiene  | 0.394      | 0.417      | 0.416      | 0.399      | 0.375      | 0.350      | 0.322      | 0.294      | 0.371  | 12.213 |        |           |
| T Methacrylonitrile       | 0.171      | 0.182      | 0.179      | 0.183      | 0.177      | 0.170      | 0.155      | 0.149      | 0.171  | 7.403  |        |           |
| T Isobutyl Alcohol        | 0.006      | 0.006      | 0.008      | 0.010      | 0.011      | 0.011      | 0.012      | 0.009      | 25.809 | 0.993  |        |           |
| T 1-Butanol               |            |            | 0.001      | 0.003      | 0.004      | 0.005      | 0.005      | 0.005      | 0.004  | 42.424 | 0.996  |           |
| T Cyclohexanone           |            |            | 0.009      | 0.010      | 0.011      | 0.011      | 0.010      | 0.010      | 0.010  | 6.640  |        |           |
| T 2-Nitropropane          |            |            |            | 0.074      | 0.078      | 0.081      | 0.080      | 0.075      | 0.075  | 0.077  | 3.841  |           |
| T Ethyl Acetate           | 0.239      | 0.260      | 0.249      | 0.254      | 0.242      | 0.225      | 0.203      | 0.193      | 0.233  | 10.353 |        |           |
| T Methyl methacrylate     | 0.230      | 0.251      | 0.246      | 0.247      | 0.236      | 0.221      | 0.200      | 0.188      | 0.227  | 10.105 |        |           |
| I Chlorobenzene-d5        | ISTD       |            |            |            |            |            |            |            |        |        |        |           |
| I 1, 4-Dichlorobenzene-d4 | ISTD       |            |            |            |            |            |            |            |        |        |        |           |

Fri Jun 23 10:01:47 2017

## Calibration Table Report

Method: 8260W.M

Title: 8260B/624 (SOP: OVL MSV01) Water 100217 HPMS11

Last Calibration: Wed Oct 04 08:27:17 2017

Curve: WG632177

## Calibration Files

|   | 0.3        | 0.4        | 1          | 2          | 5          | 20         | 50         | 100        | 200        | 300        | Avg   | %RSD   | Linear | Quadratic |        |        |        |       |
|---|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------|--------|--------|-----------|--------|--------|--------|-------|
|   | 11M21814.D | 11M21817.D | 11M21818.D | 11M21819.D | 11M21820.D | 11M21821.D | 11M21822.D | 11M21823.D | 11M21824.D | 11M21825.D |       |        |        |           |        |        |        |       |
| Compound                                |            |            |            |            |            |            |            |            |            |            |       |        |        |           |        |        |        |       |
| Curve: WG632177                         |            |            |            |            |            |            |            |            |            |            |       |        |        |           |        |        |        |       |
| I Fluorobenzene                         | ISTD       |            |            |            |            |            |            |            |            |            |       |        |        |           |        |        |        |       |
| T Dichlorodifluoromethane               |            | 0.317      | 0.352      | 0.359      | 0.481      | 0.487      | 0.443      | 0.388      |            |            | 0.404 | 16.561 | 0.991  |           |        |        |        |       |
| P Chloromethane                         |            | 0.523      | 0.421      | 0.432      | 0.442      | 0.430      | 0.375      |            |            |            | 0.437 | 10.979 |        |           |        |        |        |       |
| C Vinyl Chloride                        |            | 0.343      | 0.381      | 0.416      | 0.389      | 0.424      | 0.371      | 0.412      | 0.292      |            | 0.379 | 11.621 |        |           |        |        |        |       |
| T 1,3-Butadiene                         |            |            | 0.360      | 0.357      | 0.365      | 0.344      | 0.317      | 0.276      |            |            | 0.337 | 10.158 |        |           |        |        |        |       |
| T Bromomethane                          |            |            | 0.240      | 0.224      | 0.223      | 0.221      | 0.250      | 0.242      | 0.235      |            | 0.233 | 4.756  |        |           |        |        |        |       |
| T Chloroethane                          |            |            | 0.247      | 0.272      | 0.267      | 0.274      | 0.281      | 0.272      | 0.254      |            | 0.267 | 4.505  |        |           |        |        |        |       |
| T Trichlorofluoromethane                |            | 0.500      | 0.474      | 0.560      | 0.537      | 0.527      | 0.549      | 0.526      | 0.482      |            | 0.519 | 5.970  |        |           |        |        |        |       |
| T Diethyl ether                         |            |            | 0.264      | 0.324      | 0.317      | 0.315      | 0.317      | 0.290      |            |            | 0.276 | 0.300  | 7.859  |           |        |        |        |       |
| T Isoprene                              |            | 0.402      | 0.413      | 0.479      | 0.519      | 0.563      | 0.549      | 0.532      | 0.482      |            | 0.492 | 12.153 |        |           |        |        |        |       |
| T Acrolein                              |            |            | 0.011      | 0.032      | 0.036      | 0.036      | 0.038      | 0.037      |            |            | 0.037 | 0.032  | 29.740 | 1.000     |        |        |        |       |
| T 1,1,2-Trichloro-1,2,2-Trifluoroethane |            |            | 0.216      | 0.270      | 0.285      | 0.276      | 0.295      | 0.283      | 0.270      |            | 0.270 | 9.537  |        |           |        |        |        |       |
| T Acetone                               |            |            |            | 0.125      | 0.129      | 0.099      | 0.100      | 0.098      | 0.098      | 0.091      | 0.106 | 14.322 |        |           |        |        |        |       |
| C 1,1-Dichloroethene                    |            | 0.498      | 0.468      | 0.535      | 0.554      | 0.536      | 0.562      | 0.531      | 0.481      |            | 0.521 | 6.599  |        |           |        |        |        |       |
| T Tert-Butyl Alcohol                    |            |            | 0.024      | 0.027      | 0.028      | 0.030      | 0.031      | 0.031      |            |            | 0.035 | 0.029  | 12.232 |           |        |        |        |       |
| T Dimethyl Sulfide                      |            | 0.251      | 0.334      | 0.363      | 0.389      | 0.415      | 0.422      | 0.399      | 0.369      |            | 0.368 | 15.060 | 0.997  |           |        |        |        |       |
| T Iodomethane                           |            |            | 0.110      | 0.191      | 0.228      | 0.289      | 0.303      | 0.293      | 0.271      |            | 0.241 | 29.108 | 0.997  |           |        |        |        |       |
| T Methyl acetate                        |            |            |            | 0.262      | 0.281      | 0.292      | 0.300      | 0.290      | 0.273      |            | 0.283 | 4.913  |        |           |        |        |        |       |
| T Methylene Chloride                    |            |            | 0.385      | 0.419      | 0.372      | 0.344      | 0.352      | 0.331      | 0.301      |            | 0.358 | 10.748 |        |           |        |        |        |       |
| T Carbon Disulfide                      |            |            | 0.902      | 0.994      | 1.017      | 1.037      | 1.001      | 0.892      | 0.739      |            | 0.940 | 11.167 |        |           |        |        |        |       |
| T Acrylonitrile                         |            | 0.103      | 0.120      | 0.126      | 0.132      | 0.140      | 0.136      |            |            | 0.124      | 0.126 | 9.675  |        |           |        |        |        |       |
| T Methyl Tert Butyl Ether               |            | 0.662      | 0.754      | 0.659      | 0.886      | 0.873      | 0.926      | 0.866      | 0.771      |            | 0.825 | 10.613 |        |           |        |        |        |       |
| T trans-1,2-Dichloroethene              |            | 0.244      | 0.278      | 0.285      | 0.310      | 0.300      | 0.320      | 0.302      | 0.278      |            | 0.289 | 8.199  |        |           |        |        |        |       |
| T n-Hexane                              |            |            |            |            | 0.486      | 0.483      | 0.526      | 0.514      | 0.500      | 0.452      | 0.494 | 5.285  |        |           |        |        |        |       |
| T Diisopropyl ether                     |            |            | 1.209      | 1.393      | 1.358      | 1.295      | 1.253      | 1.039      |            | 0.912      | 1.208 | 14.413 |        |           |        |        |        |       |
| T Vinyl Acetate                         |            |            |            |            | 0.619      | 0.683      | 0.698      | 0.706      | 0.682      | 0.572      | 0.660 | 8.001  |        |           |        |        |        |       |
| P 1,1-Dichloroethane                    |            | 0.637      | 0.658      | 0.710      | 0.726      | 0.679      | 0.688      | 0.636      | 0.559      |            | 0.662 | 7.950  |        |           |        |        |        |       |
| T Ethyl-Tert-Butyl ether                |            |            |            |            | 0.992      | 1.180      | 1.142      | 1.102      | 1.084      | 0.918      | 0.821 | 1.034  | 12.532 |           |        |        |        |       |
| T 2-Butanone                            |            |            |            |            |            | 0.180      | 0.181      | 0.154      | 0.164      | 0.160      | 0.154 | 0.151  | 0.164  | 7.692     |        |        |        |       |
| T Propionitrile                         |            |            |            |            |            | 0.044      | 0.046      | 0.048      | 0.050      | 0.048      |       | 0.049  | 0.047  | 4.559     |        |        |        |       |
| T 2,2-Dichloropropane                   |            |            |            |            |            | 0.477      | 0.518      | 0.498      | 0.488      | 0.506      | 0.489 | 0.445  | 0.489  | 4.802     |        |        |        |       |
| T cis-1,2-Dichloroethene                |            |            |            |            |            | 0.315      | 0.321      | 0.354      | 0.355      | 0.342      | 0.356 | 0.339  | 0.310  | 0.336     | 5.600  |        |        |       |
| C Chloroform                            |            | 0.464      | 0.567      | 0.591      | 0.639      | 0.638      | 0.607      | 0.612      | 0.566      | 0.498      | 0.578 | 9.649  |        |           |        |        |        |       |
| T 1-Bromopropane                        |            |            |            |            |            |            | 0.057      | 0.059      | 0.059      | 0.061      | 0.060 | 0.059  | 0.056  | 0.059     | 2.678  |        |        |       |
| T Bromochloromethane                    |            |            |            |            |            | 0.125      | 0.184      | 0.202      | 0.198      | 0.192      | 0.203 | 0.193  | 0.182  | 0.185     | 13.762 |        |        |       |
| T Tetrahydrofuran                       |            |            |            |            |            |            | 0.099      | 0.105      | 0.103      | 0.111      | 0.114 | 0.107  |        | 0.105     | 0.106  | 4.537  |        |       |
| S Dibromofluoromethane                  |            |            |            |            |            |            | 0.299      | 0.317      | 0.329      | 0.318      | 0.311 | 0.305  | 0.290  | 0.279     | 0.306  | 5.259  |        |       |
| T 1,1,1-Trichloroethane                 |            |            |            |            |            |            | 0.462      | 0.471      | 0.502      | 0.532      | 0.514 | 0.538  | 0.513  | 0.462     | 0.499  | 6.125  |        |       |
| T Cyclohexane                           |            |            |            |            |            |            | 0.446      | 0.518      | 0.610      | 0.657      | 0.668 | 0.646  | 0.617  | 0.554     | 0.589  | 13.152 |        |       |
| T 1,1-Dichloropropene                   |            |            |            |            |            |            | 0.341      | 0.374      | 0.446      | 0.450      | 0.445 | 0.463  | 0.436  | 0.399     | 0.419  | 10.350 |        |       |
| T Carbon Tetrachloride                  |            |            |            |            |            |            | 0.360      | 0.423      | 0.446      | 0.476      | 0.454 | 0.472  | 0.455  | 0.418     | 0.438  | 8.625  |        |       |
| T Tert-Amyl-Methyl ether                |            |            |            |            |            |            | 0.782      | 0.937      | 0.927      | 0.896      | 0.891 | 0.760  |        | 0.681     | 0.839  | 11.697 |        |       |
| S 1,2-Dichloroethane-d4                 |            |            |            |            |            |            | 0.507      | 0.462      | 0.424      | 0.434      | 0.424 | 0.406  | 0.385  | 0.366     | 0.426  | 10.349 |        |       |
| T 1,2-Dichloroethane                    |            |            |            |            |            |            | 0.450      | 0.486      | 0.536      | 0.536      | 0.496 | 0.513  | 0.480  | 0.425     | 0.490  | 7.994  |        |       |
| T Benzene                               |            |            |            |            |            |            | 1.513      | 1.304      | 1.448      | 1.430      | 1.312 | 1.262  | 1.095  |           | 1.338  | 10.467 |        |       |
| T Trichloroethene                       |            |            |            |            |            |            | 0.246      | 0.272      | 0.290      | 0.303      | 0.306 | 0.313  | 0.299  | 0.277     | 0.288  | 7.619  |        |       |
| T Methylcyclohexane                     |            |            |            |            |            |            | 0.382      | 0.409      | 0.491      | 0.524      | 0.528 | 0.529  | 0.507  | 0.463     | 0.479  | 11.760 |        |       |
| C 1,2-Dichloropropane                   |            |            |            |            |            |            | 0.390      | 0.347      | 0.381      | 0.396      | 0.376 | 0.400  | 0.377  | 0.345     | 0.377  | 5.480  |        |       |
| T 1,4-Dioxane                           |            |            |            |            |            |            |            | 0.001      | 0.002      | 0.003      | 0.003 | 0.003  |        | 0.003     | 0.002  | 25.008 | 0.999  |       |
| T Bromodichloromethane                  |            |            |            |            |            |            | 0.360      | 0.400      | 0.455      | 0.470      | 0.452 | 0.481  | 0.455  | 0.410     | 0.435  | 9.495  |        |       |
| T Dibromomethane                        |            |            |            |            |            |            | 0.120      | 0.150      | 0.192      | 0.205      | 0.198 | 0.211  | 0.201  | 0.189     | 0.183  | 17.340 | 0.998  |       |
| T 2-Chloroethyl Vinyl Ether             |            |            |            |            |            |            | 0.137      | 0.150      | 0.173      | 0.200      | 0.216 | 0.216  | 0.205  | 0.190     | 0.186  | 16.125 | 0.997  |       |
| T 4-Methyl-2-Pentanone                  |            |            |            |            |            |            |            |            | 0.106      | 0.112      | 0.127 | 0.130  | 0.128  | 0.119     | 0.120  | 8.103  |        |       |
| T cis-1,3-Dichloropropene               |            |            |            |            |            |            | 0.383      | 0.459      | 0.501      | 0.519      | 0.516 | 0.552  | 0.511  | 0.453     | 0.487  | 10.883 |        |       |
| T Dimethyl Disulfide                    |            |            |            |            |            |            |            |            | 0.204      | 0.219      | 0.287 | 0.321  | 0.325  | 0.306     | 0.276  | 0.277  | 17.349 | 0.995 |

|   |                             |      |       |       |       |       |       |       |       |             |                    |                    |
|---|-----------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------------|--------------------|--------------------|
| I | Chlorobenzene-d5            | ISTD |       |       |       |       |       |       |       |             |                    |                    |
| S | Toluene-d8                  |      | 1.702 | 1.593 | 1.630 | 1.563 | 1.505 | 1.364 | 1.177 | 1.505       | 11.930             |                    |
| C | Toluene                     |      | 1.731 | 1.716 | 1.901 | 1.910 | 1.833 | 1.741 | 1.458 | 1.756       | 8.753              |                    |
| T | Ethyl Methacrylate          |      | 0.389 | 0.424 | 0.497 | 0.594 | 0.616 | 0.579 | 0.521 | 0.469       | 0.511 16.040 0.990 |                    |
| T | trans-1,3-Dichloropropene   |      | 0.549 | 0.625 | 0.658 | 0.665 | 0.699 | 0.644 | 0.561 | 0.629       | 8.765              |                    |
| T | 1,1,2-Trichloroethane       |      | 0.344 | 0.328 | 0.369 | 0.391 | 0.371 | 0.393 | 0.358 | 0.325       | 0.360 7.239        |                    |
| T | 2-Hexanone                  |      |       |       | 0.280 | 0.305 | 0.336 | 0.327 | 0.316 | 0.290       | 0.309 7.017        |                    |
| T | 1,3-Dichloropropane         |      | 0.598 | 0.641 | 0.697 | 0.694 | 0.680 | 0.703 | 0.637 | 0.550       | 0.650 8.355        |                    |
| T | Tetrachloroethene           |      | 0.306 | 0.300 | 0.353 | 0.355 | 0.337 | 0.346 | 0.324 | 0.295       | 0.327 7.405        |                    |
| T | Dibromo-chloromethane       |      | 0.279 | 0.361 | 0.399 | 0.423 | 0.421 | 0.457 | 0.432 | 0.394       | 0.396 13.907       |                    |
| T | 1,2-Dibromoethane           |      | 0.291 | 0.330 | 0.347 | 0.371 | 0.367 | 0.382 | 0.362 | 0.328       | 0.347 8.565        |                    |
| T | 1-Chlorohexane              |      | 0.470 | 0.446 | 0.522 | 0.552 | 0.619 | 0.629 | 0.587 | 0.520       | 0.458 0.534 12.632 |                    |
| P | Chlorobenzene               |      | 1.115 | 1.140 | 1.245 | 1.214 | 1.140 | 1.120 | 0.981 | 0.801       | 1.094 12.973       |                    |
| T | 1,1,1,2-Tetrachloroethane   |      | 0.405 | 0.386 | 0.422 | 0.457 | 0.427 | 0.453 | 0.423 | 0.381       | 0.419 6.613        |                    |
| C | Ethylbenzene                |      | 0.562 | 0.626 | 0.644 | 0.627 | 0.649 | 0.594 | 0.514 | 0.602 8.186 |                    |                    |
| T | m-,p-Xylene                 |      | 0.629 | 0.657 | 0.766 | 0.773 | 0.747 | 0.723 | 0.616 | 0.485       | 0.67428 14.5549    |                    |
| T | o-Xylene                    |      | 0.646 | 0.578 | 0.760 | 0.700 | 0.743 | 0.758 | 0.689 | 0.595       | 0.684 10.418       |                    |
| T | Styrene                     |      | 0.894 | 0.861 | 1.074 | 1.198 | 1.232 | 1.268 | 1.109 |             | 1.091 14.750       |                    |
| P | Bromoform                   |      |       | 0.194 | 0.241 | 0.251 | 0.267 | 0.304 | 0.292 | 0.282       | 0.262 14.212       |                    |
| T | Isopropylbenzene            |      | 1.733 | 1.680 | 1.897 | 1.964 | 1.867 | 1.834 | 1.533 | 1.190       | 1.712 14.690       |                    |
| I | 1,4-Dichlorobenzene-d4      | ISTD |       |       |       |       |       |       |       |             |                    |                    |
| P | 1,1,2,2-Tetrachloroethane   |      | 0.856 | 0.792 | 0.995 | 0.930 | 0.962 | 1.021 | 0.917 | 0.854       | 0.916 8.504        |                    |
| S | p-Bromofluorobenzene        |      |       | 1.386 | 1.301 | 1.189 | 1.254 | 1.256 | 1.158 | 1.117       | 1.021 1.210 9.418  |                    |
| T | 1,2,3-Trichloropropane      |      | 0.216 | 0.262 | 0.235 | 0.274 | 0.291 | 0.269 | 0.263 |             | 0.258 9.732        |                    |
| T | trans-1,4-Dichloro-2-Butene |      | 0.221 | 0.282 | 0.305 | 0.337 | 0.368 | 0.355 | 0.357 | 0.304       | 0.316 15.486 0.993 |                    |
| T | n-Propylbenzene             |      | 4.363 | 4.202 | 5.007 | 5.005 | 4.794 | 4.488 | 3.543 |             | 4.486 11.586       |                    |
| T | Bromobenzene                |      | 0.836 | 1.086 | 0.938 | 1.033 | 0.964 | 0.980 | 1.018 | 0.903       | 0.815              | 0.952 9.451        |
| T | 1,3,5-Trimethylbenzene      |      | 2.540 | 2.682 | 3.189 | 3.266 | 3.248 | 3.221 | 2.671 | 2.131       |                    | 2.868 14.758       |
| T | 2-Chlorotoluene             |      | 3.142 | 3.327 | 3.586 | 3.508 | 3.393 | 3.287 | 2.680 |             |                    | 3.275 9.155        |
| T | 4-Chlorotoluene             |      | 2.565 | 2.305 | 2.684 | 2.658 | 2.507 | 2.480 | 2.023 |             |                    | 2.460 9.358        |
| T | a-Methylstyrene             |      |       |       |       | 1.502 | 1.732 | 1.790 | 1.567 | 1.355       |                    | 1.569 11.070       |
| T | tert-Butylbenzene           |      | 0.492 | 0.684 | 0.657 | 0.667 | 0.702 | 0.644 | 0.606 |             |                    | 0.636 11.093       |
| T | 1,2,4-Trimethylbenzene      |      | 2.859 | 3.390 | 3.460 | 3.390 | 3.298 | 2.703 |       |             |                    | 3.183 10.045       |
| T | sec-Butylbenzene            |      | 3.479 | 4.237 | 4.181 | 4.079 | 3.971 | 3.198 |       |             |                    | 3.858 10.929       |
| T | p-Isopropyltoluene          |      | 2.606 | 3.292 | 3.308 | 3.280 | 3.264 | 2.713 |       |             |                    | 3.077 10.582       |
| T | 1,3-Dichlorobenzene         |      | 1.887 | 1.604 | 1.979 | 1.873 | 1.802 | 1.836 | 1.590 | 1.342       |                    | 1.739 12.078       |
| T | 1,4-Dichlorobenzene         |      | 1.802 | 1.723 | 2.034 | 1.870 | 1.801 | 1.819 | 1.572 | 1.328       |                    | 1.743 12.174       |
| T | n-Butylbenzene              |      | 3.011 | 3.306 | 3.361 | 3.333 | 3.343 | 2.759 | 2.165 |             |                    | 3.040 14.690       |
| T | 1,2-Dichlorobenzene         |      | 1.637 | 1.941 | 1.638 | 1.867 | 1.761 | 1.730 | 1.759 | 1.529       | 1.294              | 1.684 11.369       |
| T | 1,2-Dibromo-3-Chloropropane |      |       |       | 0.156 | 0.142 | 0.162 | 0.198 | 0.191 | 0.197       |                    | 0.174 13.906       |
| T | 1,2,4-Trichlorobenzene      |      | 1.104 | 1.059 | 1.236 | 1.136 | 1.220 | 1.308 | 1.175 | 1.079       |                    | 1.165 7.369        |
| T | Hexachlorobutadiene         |      | 0.460 | 0.537 | 0.646 | 0.611 | 0.617 | 0.632 | 0.623 | 0.608       |                    | 0.592 10.534       |
| T | Naphthalene                 |      | 1.916 | 1.911 | 2.237 | 2.201 | 2.502 | 2.632 | 2.218 | 1.866       |                    | 2.185 12.866       |
| T | 1,2,3-Trichlorobenzene      |      | 0.710 | 0.867 | 0.950 | 1.136 | 1.113 | 1.110 | 1.205 | 1.062       | 1.013              | 1.021 15.230 0.996 |

Wed Oct 04 11:30:41 2017

Microbac Laboratories Inc.  
ALTERNATE SOURCE CALIBRATION REPORT

|                                 |                                   |                               |
|---------------------------------|-----------------------------------|-------------------------------|
| Login Number: <u>L17100037</u>  | Run Date: <u>10/03/2017</u>       | Sample ID: <u>WG632177-12</u> |
| Instrument ID: <u>HPMS11</u>    | Run Time: <u>17:38</u>            | Method: <u>8260B</u>          |
| File ID: <u>11M21930</u>        | Analyst: <u>JDS</u>               | QC Key: <u>DOWWVO2012</u>     |
| ICAL Workgroup: <u>WG632177</u> | Cal ID: <u>HPMS11 - 02-OCT-17</u> |                               |

| Analyte                   | Expected | Found | Units | RF     | %D    | UCL | Q |
|---------------------------|----------|-------|-------|--------|-------|-----|---|
| 1,1-Dichloroethene        | CCC      | 50.0  | ug/L  | 0.514  | 1.30  | 25  |   |
| 1,2-Dichloropropane       | CCC      | 50.0  | ug/L  | 0.361  | 4.10  | 25  |   |
| Chloroform                | CCC      | 50.0  | ug/L  | 0.551  | 4.60  | 25  |   |
| Ethylbenzene              | CCC      | 50.0  | ug/L  | 0.574  | 4.60  | 25  |   |
| Toluene                   | CCC      | 50.0  | ug/L  | 1.51   | 13.8  | 25  |   |
| Vinyl Chloride            | CCC      | 50.0  | ug/L  | 0.419  | 10.7  | 25  |   |
| Bromoform                 | SPCC     | 50.0  | ug/L  | 0.239  | 8.60  | 25  |   |
| 1,1,2,2-Tetrachloroethane | SPCC     | 50.0  | ug/L  | 0.782  | 14.7  | 25  |   |
| 1,1-Dichloroethane        | SPCC     | 50.0  | ug/L  | 0.599  | 9.40  | 25  |   |
| Chlorobenzene             | SPCC     | 50.0  | ug/L  | 0.996  | 9.00  | 25  |   |
| Chloromethane             | SPCC     | 50.0  | ug/L  | 0.435  | 0.600 | 25  |   |
| o-Xylene                  |          | 50.0  | ug/L  | 0.691  | 1.10  | 25  |   |
| m-,p-Xylene               |          | 100   | ug/L  | 0.641  | 5.00  | 25  |   |
| 1,1,2-Trichloroethane     |          | 50.0  | ug/L  | 0.323  | 10.2  | 25  |   |
| 1,2-Dichloroethane        |          | 50.0  | ug/L  | 0.451  | 8.00  | 25  |   |
| 1,2,4-Trimethylbenzene    |          | 50.0  | ug/L  | 2.73   | 14.2  | 25  |   |
| 1,4-Dichlorobenzene       |          | 50.0  | ug/L  | 1.54   | 11.7  | 25  |   |
| 1,3,5-Trimethylbenzene    |          | 50.0  | ug/L  | 2.64   | 8.10  | 25  |   |
| 1,3-Dichlorobenzene       |          | 50.0  | ug/L  | 1.52   | 12.9  | 25  |   |
| 2-Butanone                |          | 50.0  | ug/L  | 0.142  | 13.4  | 25  |   |
| 4-Methyl-2-Pentanone      |          | 50.0  | ug/L  | 0.113  | 6.40  | 25  |   |
| Acetone                   |          | 50.0  | ug/L  | 0.0859 | 18.6  | 25  |   |
| 2-Hexanone                |          | 50.0  | ug/L  | 0.294  | 5.00  | 25  |   |
| Benzene                   |          | 50.0  | ug/L  | 1.13   | 15.4  | 25  |   |
| Bromodichloromethane      |          | 50.0  | ug/L  | 0.416  | 4.30  | 25  |   |
| Bromomethane              |          | 50.0  | ug/L  | 0.233  | 0.100 | 25  |   |
| Carbon Disulfide          |          | 50.0  | ug/L  | 0.792  | 15.8  | 25  |   |
| Carbon Tetrachloride      |          | 50.0  | ug/L  | 0.427  | 2.40  | 25  |   |
| Dibromochloromethane      |          | 50.0  | ug/L  | 0.377  | 4.60  | 25  |   |
| Dichlorodifluoromethane   |          | 50.0  | ug/L  | 0.506  | 20.6  | 25  |   |
| cis-1,2-Dichloroethene    |          | 50.0  | ug/L  | 0.320  | 4.80  | 25  |   |
| Diethyl ether             |          | 100   | ug/L  | 0.271  | 9.70  | 25  |   |
| Methylene Chloride        |          | 50.0  | ug/L  | 0.312  | 12.7  | 25  |   |
| Naphthalene               |          | 50.0  | ug/L  | 2.06   | 5.70  | 25  |   |
| Styrene                   |          | 50.0  | ug/L  | 1.11   | 2.00  | 25  |   |
| Tetrachloroethene         |          | 50.0  | ug/L  | 0.313  | 4.20  | 25  |   |
| trans-1,2-Dichloroethene  |          | 50.0  | ug/L  | 0.292  | 1.00  | 25  |   |
| Trichloroethene           |          | 50.0  | ug/L  | 0.286  | 0.800 | 25  |   |
| Trichlorofluoromethane    |          | 50.0  | ug/L  | 0.513  | 1.30  | 25  |   |
| Xylenes                   |          | 150   | ug/L  | 0.666  | 2.90  | 25  |   |

\* Exceeds %D Limit

ALT - Modified 09/06/2007  
 Version 1.5 PDF File ID: 5518896  
 Report generated 10/10/2017 08:46

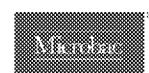


Microbac Laboratories Inc.  
ALTERNATE SOURCE CALIBRATION REPORT

Login Number:L17100037 Run Date:10/03/2017 Sample ID:WG632177-12  
Instrument ID:HPMS11 Run Time:17:38 Method:8260B  
File ID:11M21930 Analyst:JDS QC Key:DOWWVO2012  
ICal Workgroup:WG632177 Cal ID:HPMS11 - 02-OCT-17

| Analyte                                 | Expected | Found | Units | RF | %D | UCL | Q |
|---|----------|-------|-------|----|----|-----|---|
| CCC Calibration Check Compounds         |          |       |       |    |    |     |   |
| SPCC System Performance Check Compounds |          |       |       |    |    |     |   |

ALT - Modified 09/06/2007  
Version 1.5 PDF File ID: 5518896  
Report generated 10/10/2017 08:46



Login Number: L17100037 Run Date: 10/06/2017 Sample ID: WG632949-02  
 Instrument ID: HPMS11 Run Time: 11:33 Method: 8260B  
 File ID: 11M22046 Analyst: JDS QC Key: DOWWVO2012  
 Workgroup (AAB#): WG632950 Cal ID: HPMS11 - 02-OCT-17  
 Matrix: WATER

| Analyte                   | Expected | Found | UNITS | RF     | %D    | UCL  | Q  |
|---------------------------|----------|-------|-------|--------|-------|------|----|
| 1,1-Dichloroethene        | CCC      | 50.0  | ug/L  | 0.505  | 2.98  | 25   |    |
| 1,2-Dichloropropane       | CCC      | 50.0  | ug/L  | 0.350  | 7.12  | 25   |    |
| Chloroform                | CCC      | 50.0  | ug/L  | 0.543  | 6.10  | 25   |    |
| Ethylbenzene              | CCC      | 50.0  | ug/L  | 0.589  | 2.14  | 25   |    |
| Toluene                   | CCC      | 50.0  | ug/L  | 1.58   | 10.2  | 25   |    |
| Vinyl Chloride            | CCC      | 50.0  | 52.6  | ug/L   | 0.398 | 5.17 | 25 |
| Bromoform                 | SPCC     | 50.0  | ug/L  | 0.255  | 2.40  | 25   |    |
| 1,1,2,2-Tetrachloroethane | SPCC     | 50.0  | ug/L  | 0.890  | 2.83  | 25   |    |
| 1,1-Dichloroethane        | SPCC     | 50.0  | ug/L  | 0.610  | 7.73  | 25   |    |
| Chlorobenzene             | SPCC     | 50.0  | ug/L  | 1.02   | 7.20  | 25   |    |
| Chloromethane             | SPCC     | 50.0  | 43.4  | ug/L   | 0.379 | 13.3 | 25 |
| m-,p-Xylene               |          | 100   | ug/L  | 0.658  | 2.50  | 25   |    |
| o-Xylene                  |          | 50.0  | ug/L  | 0.696  | 1.87  | 25   |    |
| 1,1,2-Trichloroethane     |          | 50.0  | ug/L  | 0.337  | 6.33  | 25   |    |
| 1,2-Dichloroethane        |          | 50.0  | ug/L  | 0.439  | 10.4  | 25   |    |
| 1,2,4-Trimethylbenzene    |          | 50.0  | ug/L  | 3.08   | 3.34  | 25   |    |
| 1,4-Dichlorobenzene       |          | 50.0  | ug/L  | 1.65   | 5.08  | 25   |    |
| 1,3,5-Trimethylbenzene    |          | 50.0  | ug/L  | 2.99   | 4.26  | 25   |    |
| 1,3-Dichlorobenzene       |          | 50.0  | ug/L  | 1.68   | 3.30  | 25   |    |
| 2-Butanone                |          | 50.0  | ug/L  | 0.137  | 16.1  | 25   |    |
| 4-Methyl-2-Pentanone      |          | 50.0  | ug/L  | 0.106  | 11.9  | 25   |    |
| Acetone                   |          | 50.0  | ug/L  | 0.0830 | 21.4  | 25   |    |
| 2-Hexanone                |          | 50.0  | ug/L  | 0.286  | 7.60  | 25   |    |
| Benzene                   |          | 50.0  | ug/L  | 1.12   | 16.0  | 25   |    |
| Bromodichloromethane      |          | 50.0  | ug/L  | 0.419  | 3.78  | 25   |    |
| Bromomethane              |          | 50.0  | ug/L  | 0.231  | 0.941 | 25   |    |
| Carbon Disulfide          |          | 50.0  | ug/L  | 0.878  | 6.66  | 25   |    |
| Carbon Tetrachloride      |          | 50.0  | ug/L  | 0.415  | 5.27  | 25   |    |
| Dibromochloromethane      |          | 50.0  | ug/L  | 0.397  | 0.427 | 25   |    |
| Dichlorodifluoromethane   |          | 50.0  | ug/L  | 0.457  | 8.80  | 25   |    |
| cis-1,2-Dichloroethene    |          | 50.0  | ug/L  | 0.320  | 4.99  | 25   |    |
| Diethyl ether             |          | 100   | ug/L  | 0.277  | 7.72  | 25   |    |
| Methylene Chloride        |          | 50.0  | ug/L  | 0.317  | 11.3  | 25   |    |
| Naphthalene               |          | 50.0  | ug/L  | 2.36   | 8.10  | 25   |    |
| Styrene                   |          | 50.0  | ug/L  | 1.13   | 3.83  | 25   |    |
| Tetrachloroethene         |          | 50.0  | ug/L  | 0.321  | 1.93  | 25   |    |
| trans-1,2-Dichloroethene  |          | 50.0  | ug/L  | 0.284  | 1.86  | 25   |    |
| Trichloroethene           |          | 50.0  | ug/L  | 0.278  | 3.63  | 25   |    |
| Trichlorofluoromethane    |          | 50.0  | ug/L  | 0.502  | 3.38  | 25   |    |
| Xylenes                   |          | 150   | ug/L  | 0.677  | 1.04  | 25   |    |

\* Exceeds %D Criteria

CCV - Modified 03/05/2008  
 PDF File ID: 5518898  
 Report generated 10/10/2017 08:46



Microbac Laboratories Inc.  
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number:L17100037 Run Date:10/06/2017 Sample ID:WG632949-02  
Instrument ID:HPMS11 Run Time:11:33 Method:8260B  
File ID:11M22046 Analyst:JDS QC Key:DOWWVO2012  
Workgroup (AAB#):WG632950 Cal ID:HPMS11 - 02-OCT-17  
Matrix:WATER

| Analyte                                 | Expected | Found | UNITS | RF | %D | UCL | Q |
|---|----------|-------|-------|----|----|-----|---|
| CCC Calibration Check Compounds         |          |       |       |    |    |     |   |
| SPCC System Performance Check Compounds |          |       |       |    |    |     |   |

CCV - Modified 03/05/2008  
PDF File ID: 5518898  
Report generated 10/10/2017 08:46



Microbac Laboratories Inc.  
INTERNAL STANDARD AREA SUMMARY  
(COMPARED TO MIDPOINT OF ICAL)

Login Number:L17100037  
Instrument ID:HPMS11  
Workgroup (AAB#):WG632950

ICAL CCV Number:WG632177-08  
CAL ID: HPMS11 - 02-OCT-17  
Matrix:WATER

| Sample Number       | Dilution | Tag | IS-1   | IS-2   | IS-3   |
|---------------------|----------|-----|--------|--------|--------|
| WG632177-08         | NA       | NA  | 144705 | 292416 | 410769 |
| Upper Limit         | NA       | NA  | 289410 | 584832 | 821538 |
| Lower Limit         | NA       | NA  | 72353  | 146208 | 205385 |
| <u>L17100037-01</u> | 1.00     | 01  | 120016 | 268483 | 391202 |
| L17100037-02        | 1.00     | 01  | 123701 | 270604 | 390192 |
| L17100037-03        | 1.00     | 01  | 116251 | 258336 | 371096 |
| L17100037-04        | 1.00     | 01  | 119403 | 266082 | 386737 |
| L17100037-05        | 1.00     | 01  | 121541 | 274640 | 397906 |
| L17100037-06        | 1.00     | 01  | 112161 | 255812 | 365885 |
| L17100037-07        | 1.00     | 01  | 119806 | 269276 | 391965 |
| WG632950-01         | 1.00     | 01  | 119381 | 278127 | 406975 |
| WG632950-02         | 1.00     | 01  | 131302 | 280240 | 403683 |

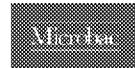
IS-1 - 1,4-Dichlorobenzene-d4

IS-2 - Chlorobenzene-d5

IS-3 - Fluorobenzene

Underline = Response outside limits

INTERNAL\_STD\_ICAL - Modified 03/06/2008  
PDF File ID: 5518899  
Report generated 10/10/2017 08:46



Microbac Laboratories Inc.  
INTERNAL STANDARD RETENTION TIME SUMMARY  
(COMPARED TO MIDPOINT OF ICAL)

Login Number:L17100037  
Instrument ID:HPMS11  
Workgroup (AAB#):WG632950

ICAL CCV Number:WG632177-08  
CAL ID: HPMS11 - 02-OCT-17  
Matrix:WATER

| Sample Number       | Dilution | Tag | IS-1  | IS-2 | IS-3  |
|---------------------|----------|-----|-------|------|-------|
| WG632177-08         | NA       | NA  | 16.92 | 14.1 | 10.46 |
| Upper Limit         | NA       | NA  | 17.42 | 14.6 | 10.96 |
| Lower Limit         | NA       | NA  | 16.42 | 13.6 | 9.96  |
| <u>L17100037-01</u> | 1.00     | 01  | 16.92 | 14.1 | 10.47 |
| L17100037-02        | 1.00     | 01  | 16.92 | 14.1 | 10.47 |
| L17100037-03        | 1.00     | 01  | 16.92 | 14.1 | 10.47 |
| L17100037-04        | 1.00     | 01  | 16.92 | 14.1 | 10.46 |
| L17100037-05        | 1.00     | 01  | 16.92 | 14.1 | 10.47 |
| L17100037-06        | 1.00     | 01  | 16.92 | 14.1 | 10.47 |
| L17100037-07        | 1.00     | 01  | 16.92 | 14.1 | 10.47 |
| WG632950-01         | 1.00     | 01  | 16.92 | 14.1 | 10.47 |
| WG632950-02         | 1.00     | 01  | 16.92 | 14.1 | 10.46 |

IS-1 - 1,4-Dichlorobenzene-d4  
IS-2 - Chlorobenzene-d5  
IS-3 - Fluorobenzene

Underline = Response outside limits

INTERNAL\_STD\_RT\_ICAL - Modified 03/06/2008  
PDF File ID: 5518901  
Report generated: 10/10/2017 08:46



## **2.1 Volatiles Data**

## **2.1.2 RSK 175**

## **2.1.2.1 Summary Data**



**Login Number:** L17100037  
**Department:** Volatiles - GC  
**Analyst:** Heather Fairchild

## Analysis RSK-175

### HOLDING TIMES

**Sample Preparation:** All holding times were met.

**Sample Analysis:** All holding times were met.

### PREPARATION

Sample preparation proceeded normally.

### CALIBRATION

**Initial Calibration:** For all compounds that yielded a %RSD greater than 15%, linear or higher order equations were applied. All acceptance criteria were met.

**Alternate Source Standards:** All acceptance criteria were met.

**Continuing Calibration and Tune:** All acceptance criteria were met.

### BATCH QA/QC

**Method Blank:** All acceptance criteria were met.

**Laboratory Control Sample:** All acceptance criteria were met.

**Matrix Spikes/Sample Duplicates:** The MS/MSD results were not associated with this sample delivery group (SDG), due to insufficient volume of sample. Microbac Laboratories recommends site specific MS/MSD samples to avoid possible data qualifications.

### SAMPLES

**Samples:** Samples 04, and 06 required dilution analyses.

### **Manual Integration Reason Codes**

**Reason #1: Data System Fails to Select Correct Peak** In some cases the chromatography system selects and integrates the 'wrong peak'. In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

**Reason #2: Data System Splits the Peak Incorrectly or Integrates a False Peak as a Rider Peak** This phenomena is common at low concentrations where the signal:noise ratio is low. A single compound (peak) is incorrectly split into multiple peaks or integrated as a main peak with one or more rider peaks resulting in low area counts for the target compound.

**Reason #3: Improperly Integrated Isomers and/or coeluting compounds.** This system often fails to distinguish coeluting compounds and or isomers. The integration areas and concentrations are wrong, and they must be corrected by manual integration. Prime examples are benzo(k)fluoranthene and benzo(b)fluoranthene which are often unresolved and integrated improperly when both are present at low concentrations in standards or samples.

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**Narrative ID:** 130247

**Approved By:** Anthony Canter



## Certificate of Analysis

|                                |                           |                            |
|--------------------------------|---------------------------|----------------------------|
| Sample #: L17100037-01         | PrePrep Method: N/A       | Instrument: HP16           |
| Client ID: INS-EB01-092817     | Prep Method: 5021         | Prep Date: N/A             |
| Matrix: Water                  | Analytical Method: RSK175 | Cal Date: 07/19/2017 11:32 |
| Workgroup #: WG632225          | Analyst: HRF              | Run Date: 10/03/2017 10:57 |
| Collect Date: 09/28/2017 08:20 | Dilution: 1               | File ID: 16G53546          |
| Sample Tag: 01                 | Units: ug/L               |                            |

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 12.4   |      | 5.00 | 1.00 |

|                                |                           |                            |
|--------------------------------|---------------------------|----------------------------|
| Sample #: L17100037-02         | PrePrep Method: N/A       | Instrument: HP16           |
| Client ID: 0306-PW-092817      | Prep Method: 5021         | Prep Date: N/A             |
| Matrix: Water                  | Analytical Method: RSK175 | Cal Date: 07/19/2017 11:32 |
| Workgroup #: WG632225          | Analyst: HRF              | Run Date: 10/03/2017 11:51 |
| Collect Date: 09/28/2017 11:50 | Dilution: 1               | File ID: 16G53547          |
| Sample Tag: 01                 | Units: ug/L               |                            |

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 150    |      | 5.00 | 1.00 |

|                                |                           |                            |
|--------------------------------|---------------------------|----------------------------|
| Sample #: L17100037-03         | PrePrep Method: N/A       | Instrument: HP16           |
| Client ID: 0315-PW-092817      | Prep Method: 5021         | Prep Date: N/A             |
| Matrix: Water                  | Analytical Method: RSK175 | Cal Date: 07/19/2017 11:32 |
| Workgroup #: WG632225          | Analyst: HRF              | Run Date: 10/03/2017 12:02 |
| Collect Date: 09/28/2017 13:00 | Dilution: 1               | File ID: 16G53548          |
| Sample Tag: 01                 | Units: ug/L               |                            |

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 505    |      | 5.00 | 1.00 |

|                                |                           |                            |
|--------------------------------|---------------------------|----------------------------|
| Sample #: L17100037-04         | PrePrep Method: N/A       | Instrument: HP16           |
| Client ID: 0309-PW-092817      | Prep Method: 5021         | Prep Date: N/A             |
| Matrix: Water                  | Analytical Method: RSK175 | Cal Date: 07/19/2017 11:32 |
| Workgroup #: WG632225          | Analyst: HRF              | Run Date: 10/03/2017 15:26 |
| Collect Date: 09/28/2017 14:25 | Dilution: 5               | File ID: 16G53554          |
| Sample Tag: DL01               | Units: ug/L               |                            |

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 980    |      | 25.0 | 5.00 |

## Certificate of Analysis

Sample #: L17100037-05      PrePrep Method: N/A      Instrument: HP16  
Client ID: 0310-PW-092817      Prep Method: 5021      Prep Date: N/A  
Matrix: Water      Analytical Method: RSK175      Cal Date: 07/19/2017 11:32  
Workgroup #: WG632225      Analyst: HRF      Run Date: 10/03/2017 12:25  
Collect Date: 09/28/2017 15:50      Dilution: 1      File ID: 16G53550  
Sample Tag: 01      Units: ug/L

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 210    |      | 5.00 | 1.00 |

Sample #: L17100037-06      PrePrep Method: N/A      Instrument: HP16  
Client ID: 0311-PW-092817      Prep Method: 5021      Prep Date: N/A  
Matrix: Water      Analytical Method: RSK175      Cal Date: 07/19/2017 11:32  
Workgroup #: WG632225      Analyst: HRF      Run Date: 10/03/2017 15:37  
Collect Date: 09/28/2017 17:40      Dilution: 5      File ID: 16G53555  
Sample Tag: DL01      Units: ug/L

| Analyte | CAS #   | Result | Qual | RL   | MDL  |
|---------|---------|--------|------|------|------|
| Methane | 74-82-8 | 987    |      | 25.0 | 5.00 |

## **2.1.2.2 QC Summary Data**



**Login Number:** L17100037  
**Department:** Volatiles - GC  
**Analyst:** Heather Fairchild

## Analysis RSK-175

### HOLDING TIMES

**Sample Preparation:** All holding times were met.

**Sample Analysis:** All holding times were met.

### PREPARATION

Sample preparation proceeded normally.

### CALIBRATION

**Initial Calibration:** For all compounds that yielded a %RSD greater than 15%, linear or higher order equations were applied. All acceptance criteria were met.

**Alternate Source Standards:** All acceptance criteria were met.

**Continuing Calibration and Tune:** All acceptance criteria were met.

### BATCH QA/QC

**Method Blank:** All acceptance criteria were met.

**Laboratory Control Sample:** All acceptance criteria were met.

**Matrix Spikes/Sample Duplicates:** The MS/MSD results were not associated with this sample delivery group (SDG), due to insufficient volume of sample. Microbac Laboratories recommends site specific MS/MSD samples to avoid possible data qualifications.

### SAMPLES

**Samples:** Samples 04, and 06 required dilution analyses.

### **Manual Integration Reason Codes**

**Reason #1: Data System Fails to Select Correct Peak** In some cases the chromatography system selects and integrates the 'wrong peak'. In this case the analyst must correct the selection and force the system to integrate the proper peak. Other times the system may miss the peak completely.

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**Narrative ID:** 130247

**Approved By:** Anthony Canter



## Microbac Laboratories Inc.

## Data Checklist

Date: 19-JUL-2017

Analyst: HRF

Analyst: NA

Method: RSK175EXT

Instrument: HP16

Curve Workgroup: NA

Runlog ID: 83462

Analytical Workgroups: WG622365 WG622324

|  |     |
|--|-----|
| Initial Calibration  | X   |
| Average RF   | X   |
| Linear Reg or Higher Order Curve                                   | X   |
| Second Source standard % Difference                                | X   |
| Continuing Calibration /Check Standards                            | X   |
| Project/Client Specific Requirements                               | X   |
| Special Standards  | NA  |
| Blanks   | X   |
| TCL's  | X   |
| Surrogates   | NA  |
| LCS (Laboratory Control Sample)                                    | X   |
| Recoveries   | X   |
| Surrogates   | NA  |
| MS/MSD/Duplicates  | NA  |
| Samples  | X   |
| Surrogates   | NA  |
| Calculations & Correct Factors                                     | X   |
| Dilutions Run  | NA  |
| Reruns   | NA  |
| Manual Integrations  | NA  |
| Case Narrative   | NA  |
| Results Reporting/Data Qualifiers                                  | X   |
| KOBRA Workgroup Data   | X   |
| Check for Completeness   | X   |
| Primary Reviewer   | HRF |
| Secondary Reviewer   | ADC |
|  |     |
| Check for compliance with method and project specific requirements | X   |
| Check the completeness of reported information                     | X   |
| Check the information for the report narrative                     | X   |
| Check the reasonableness of the results                            | X   |

Primary Reviewer:  
21-JUL-2017Secondary Reviewer:  
24-JUL-2017

## Microbac Laboratories Inc.

## Data Checklist

Date: 03-OCT-2017

Analyst: HRF

Analyst: NA

Method: RSK175

Instrument: HP16

Curve Workgroup: NA

Runlog ID: 85070

Analytical Workgroups: WG632225

|  |     |
|--|-----|
| Initial Calibration  | X   |
| Average RF   | X   |
| Linear Reg or Higher Order Curve                                   | X   |
| Second Source standard % Difference                                | X   |
| Continuing Calibration /Check Standards                            | X   |
| Project/Client Specific Requirements                               | X   |
| Special Standards  | NA  |
| Blanks   | X   |
| TCL's  | X   |
| Surrogates   | NA  |
| LCS (Laboratory Control Sample)                                    | X   |
| Recoveries   | X   |
| Surrogates   | NA  |
| MS/MSD/Duplicates  | NA  |
| Samples  | X   |
| Surrogates   | NA  |
| Calculations & Correct Factors                                     | X   |
| Dilutions Run  | X   |
| Reruns   | NA  |
| Manual Integrations  | NA  |
| Case Narrative   | X   |
| Results Reporting/Data Qualifiers                                  | X   |
| KOBRA Workgroup Data   | X   |
| Check for Completeness   | X   |
| Primary Reviewer   | HRF |
| Secondary Reviewer   |     |
|  |     |
| Check for compliance with method and project specific requirements |     |
| Check the completeness of reported information                     |     |
| Check the information for the report narrative                     |     |
| Check the reasonableness of the results                            |     |

Primary Reviewer:  
09-OCT-2017

Secondary Reviewer:

CHECKLIST1 - Modified 03/05/2008

Generated: OCT-09-2017 13:28:45



## RSK-175 - Example Calculation for Methane

### 1.0 Linear Calibration Models

#### Option A - Average RF Method

| ICAL_x      | ICAL_r  | RF    |
|-------------|---------|-------|
| 1.67        | 19901   | 11917 |
| 6.67        | 69174   | 10371 |
| 16.7        | 176923  | 10594 |
| 66.7        | 685135  | 10272 |
| 133         | 1324853 | 9961  |
| 300         | 2845104 | 9484  |
| Average RF: |         | 10433 |

Where:

ICAL\_x = the ICAL concentration

ICAL\_r = the ICAL response (area)

RF = calibration factor = ICAL\_r / ICAL\_x

#### Option B - Agilent Linear Regression Constant

| ICAL_x                               | ICAL_r  | [ICAL_r]^2  | [ICAL_x][ICAL_r] |
|--------------------------------------|---------|-------------|------------------|
| 1.67                                 | 19901   | 396049801   | 33235            |
| 6.67                                 | 69174   | 4785042276  | 461391           |
| 16.7                                 | 176923  | 31301747929 | 2954614          |
| 66.7                                 | 685135  | 4.6941E+11  | 45698505         |
| 133                                  | 1324853 | 1.75524E+12 | 176205449        |
| 300                                  | 2845104 | 8.09462E+12 | 853531200        |
| Summation:                           |         | 1.03557E+13 | 1078884393       |
| Agilent Linear Regression Constant : |         |             | 9598.567853      |
| (1.03557E+13)/1078884393)            |         |             |                  |

### 2.0 Calculate the concentration in extract, Cx

Where:

|   |             |
|---|-------------|
| y = area response of methane from quant report  | 1157414     |
| a = average RF (or Agilent regression constant) | 10433.00    |
| Cx = y/a  | 110.9377935 |

### 3.0 Calculate the concentration in sample

$$Cs = Cx \cdot (MW/Tf) \cdot (HS/S) \cdot (DF)$$

Where:

|   |                      |
|---|----------------------|
| Cx = Concentration in extract                       | 110.9377935 umol/mol |
| MW = molecular weight of analyte                    | 16.04 ug/umol        |
| TF = temperature factor = (22.4 )(313/273)          | 25.68 L/mol          |
| HS = headspace volume                               | 0.015 L              |
| S = sample volume remaining after headspace removal | 0.00547 L            |
| DF = dilution factor                                | 2                    |
| Cs = calculated sample concentration                | 380.034301 ug/L      |

## RSK-175 - Example Calculation for Carbon Dioxide

ICAL Plot - Quadratic Regression (  $y = Ax^2 + Bx + C$  )

$$Ax^2 + Bx + (C - y) = 0$$

### Step 1 - Calculate the concentration in extract, C<sub>x</sub>

Data from quadratic regression plot:

|  |          |
|--|----------|
| Value of A from plot:                              | 0.916    |
| Value of B from plot:                              | 1540     |
| Value of C from plot:                              | 0        |
| Response for methane from quantitation report (y): | 8763828  |
| Value of C - y                                     | -8763828 |

Solving for C<sub>x</sub> using the quadratic formula:

|                                     |                      |
|-------------------------------------|----------------------|
| Root 1 - Computed C <sub>x1</sub> : | 2364.716284 umol/mol |
| Root 2 - Computed C <sub>x2</sub> : | -4045.938991         |

### Step 2 - Calculate the concentration in sample

$$C_s = C_x \times (MW/Tf) \times (HS/S) \times (DF)$$

Where:

C<sub>x</sub> = Concentration in extract :

2364.716284 umol/mol

44.0 ug/umol

MW = molecular weight of analyte:

25.68 L/mol

TF = temperature factor = (22.4 )(313/273):

0.015 L

HS = initial headspace volume (extraction log):

0.00547 L

S = final volume (extraction log):

10

DF = dilution factor:

C<sub>s</sub> = calculated sample concentration:

111106.798 ug/L

### Other Notes:

Temperature of headspace = 40 C = 313 K

| Analyte        | MW (g/mol) |
|----------------|------------|
| Methane        | 16.04      |
| Ethane         | 30.07      |
| Ethene         | 28.05      |
| Propane        | 44.1       |
| Carbon Dioxide | 44.0       |

## Microbac Laboratories Inc.

## Instrument Run Log

|             |        |           |        |         |
|-------------|--------|-----------|--------|---------|
| Instrument: | HP16   | Dataset:  | 071917 |         |
| Analyst1:   | HRF    | Analyst2: | NA     |         |
| Method:     | RSK175 | SOP:      | RSK01  | Rev: 19 |
| Method:     | 5021   | SOP:      | RSK01  | Rev: 19 |

Maintenance Log ID: \_\_\_\_\_

|                       |                        |            |
|-----------------------|------------------------|------------|
| Internal Standard: NA | Surrogate Standard: NA |            |
| CCV: STD80684         | LCS: STD81961          | MS/MSD: NA |

Column 1 ID: RTQBOND      Column 2 ID: RTQBOND  
 Workgroups: WG622365 WG622324

Comments: \_\_\_\_\_

| File ID  | Sample Information                  | pH | Mat | Dil | Reference | Date/Time      |
|----------|-------------------------------------|----|-----|-----|-----------|----------------|
| 16G52891 | WG622323-01 133umol/mol CCV RSK175  | NA | 1   | 1   | STD80684  | 07/19/17 08:54 |
| 16G52892 | WG622323-01 133umol/mol CCV RSK175  | NA | 1   | 1   | STD80684  | 07/19/17 09:18 |
| 16G52893 | WG622365-01 0.67umol/mol RSK175     | NA | 1   | 1   | STD82803  | 07/19/17 09:59 |
| 16G52894 | WG622365-02 1.67umol/mol RSK175     | NA | 1   | 1   | STD82803  | 07/19/17 10:11 |
| 16G52895 | WG622365-03 33.3umol/mol RSK175     | NA | 1   | 1   | STD82803  | 07/19/17 10:23 |
| 16G52896 | WG622365-04 66.7umol/mol RSK175     | NA | 1   | 1   | STD80684  | 07/19/17 10:34 |
| 16G52897 | WG622365-05 133umol/mol RSK175      | NA | 1   | 1   | STD80684  | 07/19/17 10:45 |
| 16G52898 | WG622365-06 333umol/mol RSK175      | NA | 1   | 1   | STD80684  | 07/19/17 10:57 |
| 16G52899 | WG622365-07 533umol/mol RSK175      | NA | 1   | 1   | STD80684  | 07/19/17 11:08 |
| 16G52900 | RINSE                               | NA | 1   | 1   |           | 07/19/17 11:20 |
| 16G52901 | WG622365-02 1.67umol/mol LCS RSK175 | NA | 1   | 1   | STD80684  | 07/19/17 11:32 |
| 16G52902 | WG622365-08 ALT 66.7umol/mol RSK175 | NA | 1   | 1   | STD81961  | 07/19/17 12:06 |
| 16G52903 | WG622323-01 CCV 133umol/mol RSK175  | NA | 1   | 1   | STD80684  | 07/19/17 12:17 |
| 16G52904 | RINSE                               | NA | 1   | 1   |           | 07/19/17 12:29 |
| 16G52905 | WG622323-01 CCV 133umol/mol RSK175  | NA | 1   | 1   | STD80684  | 07/19/17 13:00 |
| 16G52906 | WG622324-01 BLANK RSK175            | NA | 1   | 1   |           | 07/19/17 13:23 |
| 16G52907 | L17070894-01 A RSK175               | 6  | 1   | 1   |           | 07/19/17 13:35 |
| 16G52908 | WG622324-02 67umol/mol LCS RSK175   | NA | 1   | 1   | STD81961  | 07/19/17 13:47 |
| 16G52909 | WG622324-03 67umol/mol LCS2 RSK175  | NA | 1   | 1   | STD81961  | 07/19/17 14:05 |
| 16G52910 | WG622324-02 67umol/mol LCS RSK175   | NA | 1   | 1   | STD81961  | 07/19/17 14:17 |
| 16G52911 | L17070822-01 A RSK175               | <2 | 1   | 1   |           | 07/19/17 14:29 |
| 16G52912 | L17070822-03 A RSK175               | <2 | 1   | 1   |           | 07/19/17 14:40 |
| 16G52913 | L17070822-05 A RSK175               | <2 | 1   | 1   |           | 07/19/17 14:51 |
| 16G52914 | L17070822-07 A RSK175               | <2 | 1   | 1   |           | 07/19/17 15:03 |
| 16G52915 | L17070822-09 A RSK175               | <2 | 1   | 1   |           | 07/19/17 15:14 |
| 16G52916 | WG622323-02 CCV 133umol/mol RSK175  | NA | 1   | 1   | STD80684  | 07/19/17 15:26 |
| 16G52917 | L17070822-11 A RSK175               | <2 | 1   | 1   |           | 07/19/17 15:38 |
| 16G52918 | L17070823-01 A RSK175               | <2 | 1   | 1   |           | 07/19/17 15:49 |
| 16G52919 | L17070824-01 A RSK175               | <2 | 1   | 1   |           | 07/19/17 16:00 |
| 16G52920 | L17070886-01 A RSK175               | <2 | 1   | 1   |           | 07/19/17 16:11 |
| 16G52921 | L17070889-01 A RSK175               | <2 | 1   | 1   |           | 07/19/17 16:22 |
| 16G52922 | WG622323-03 CCV 133umol/mol RSK175  | NA | 1   | 1   | STD80684  | 07/19/17 16:33 |

Approved: July 24, 2017

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## Microbac Laboratories Inc.

## Instrument Run Log

|             |        |           |        |
|-------------|--------|-----------|--------|
| Instrument: | HP16   | Dataset:  | 071917 |
| Analyst1:   | HRF    | Analyst2: | NA     |
| Method:     | RSK175 | SOP:      | RSK01  |
| Method:     | 5021   | SOP:      | RSK01  |
|             |        | Rev:      | 19     |
|             |        | Rev:      | 19     |

Maintenance Log ID: \_\_\_\_\_

|                               |          |                      |          |
|-------------------------------|----------|----------------------|----------|
| Internal Standard:            | NA       | Surrogate Standard:  | NA       |
| CCV:                          | STD80684 | LCS:                 | STD81961 |
| Column 1 ID: RTQBOND          |          | Column 2 ID: RTQBOND |          |
| Workgroups: WG622365 WG622324 |          |                      |          |

Comments: \_\_\_\_\_

Comments

| Seq.                                    | Rerun | Dil. | Reason | Analytes |
|---|-------|------|--------|----------|
| 1                                       |       |      |        |          |
| File ID:16G52891                        |       |      |        |          |
| WG622323-01 LOW FAILING CCV.            |       |      |        |          |
| 2                                       |       |      |        |          |
| File ID:16G52892                        |       |      |        |          |
| WG622323-01 HIGH FAILING CCV. RUN ICAL. |       |      |        |          |
| 4                                       | X     |      |        |          |
| File ID:16G52894                        |       |      |        |          |
| WG622365-02 RERUN 1.67umol/mol ICAL.    |       |      |        |          |
| 13                                      |       |      |        |          |
| File ID:16G52903                        |       |      |        |          |
| WG622323-01 N.D. FOR CO2. RERUN CCV.    |       |      |        |          |

Approved: July 24, 2017

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## Microbac Laboratories Inc.

## Instrument Run Log

|             |        |           |        |
|-------------|--------|-----------|--------|
| Instrument: | HP16   | Dataset:  | 100317 |
| Analyst1:   | HRF    | Analyst2: | NA     |
| Method:     | RSK175 | SOP:      | RSK01  |
| Method:     | 5021   | SOP:      | RSK01  |
|             |        | Rev:      | 19     |
|             |        | Rev:      | 19     |

Maintenance Log ID: \_\_\_\_\_

|                    |          |                     |          |
|--------------------|----------|---------------------|----------|
| Internal Standard: | NA       | Surrogate Standard: | NA       |
| CCV:               | STD80684 | LCS:                | STD81961 |
|                    |          | MS/MSD:             | NA       |

|              |          |              |         |
|--------------|----------|--------------|---------|
| Column 1 ID: | RTQBOND  | Column 2 ID: | RTQBOND |
| Workgroups:  | WG632225 |              |         |

Comments: \_\_\_\_\_

| File ID  | Sample Information                 | pH | Mat | Dil | Reference | Date/Time      |
|----------|------------------------------------|----|-----|-----|-----------|----------------|
| 16G53535 | WG632224-01 133umol/mol CCV RSK175 | NA | 1   | 1   | STD80684  | 10/03/17 08:22 |
| 16G53536 | WG632225-01 BLANK RSK175           | NA | 1   | 1   |           | 10/03/17 08:34 |
| 16G53537 | L17091752-02 B 10X                 | <2 | 1   | 10  |           | 10/03/17 08:46 |
| 16G53538 | L17091752-03 B 10X RSK175          | <2 | 1   | 10  |           | 10/03/17 08:57 |
| 16G53539 | L17091752-04 B 20X RSK175          | <2 | 1   | 20  |           | 10/03/17 09:10 |
| 16G53540 | L17091752-06 B 20X RSK175          | <2 | 1   | 20  |           | 10/03/17 09:21 |
| 16G53541 | L17091752-05 B 100X RSK175         | <2 | 1   | 100 |           | 10/03/17 09:40 |
| 16G53542 | L17091752-07 B 20X RSK175          | <2 | 1   | 20  |           | 10/03/17 09:52 |
| 16G53543 | WG632225-02 67umol/mol LCS RSK175  | NA | 1   | 1   | STD81961  | 10/03/17 10:03 |
| 16G53544 | WG632225-03 67umol/mol LCS2 RSK175 | NA | 1   | 1   | STD81961  | 10/03/17 10:15 |
| 16G53545 | WG632224-02 133umol/mol CCV RSK175 | NA | 1   | 1   | STD80684  | 10/03/17 10:28 |
| 16G53546 | L17100037-01 A RSK175              | <2 | 1   | 1   |           | 10/03/17 10:57 |
| 16G53547 | L17100037-02 A RSK175              | <2 | 1   | 1   |           | 10/03/17 11:51 |
| 16G53548 | L17100037-03 A RSK175              | <2 | 1   | 1   |           | 10/03/17 12:02 |
| 16G53549 | L17100037-04 A RSK175              | <2 | 1   | 1   |           | 10/03/17 12:14 |
| 16G53550 | L17100037-05 A RSK175              | <2 | 1   | 1   |           | 10/03/17 12:25 |
| 16G53551 | L17100037-06 A RSK175              | <2 | 1   | 1   |           | 10/03/17 12:37 |
| 16G53552 | L17100067-01 A RSK175              | <2 | 1   | 1   |           | 10/03/17 12:48 |
| 16G53553 | L17100067-01 B 1X RSK175           | <2 | 1   | 1   |           | 10/03/17 14:46 |
| 16G53554 | L17100037-04 B 5X RSK175           | <2 | 1   | 5   |           | 10/03/17 15:26 |
| 16G53555 | L17100037-06 B 5X RSK175           | <2 | 1   | 5   |           | 10/03/17 15:37 |
| 16G53556 | WG632224-03 133umol/mol CCV RSK175 | NA | 1   | 1   | STD80684  | 10/03/17 15:49 |

Comments

| Seq.              | Rerun | Dil. | Reason                                 | Analytes |
|-------------------|-------|------|--|----------|
| 15                | X     | 5    | Over Calibration Range                 | METHANE  |
| File ID: 16G53549 |       |      |  |          |
|                   |       |      | L17100037-04 RERUN AT 5X FOR METHANE   |          |
| 17                | X     | 5    | Over Calibration Range                 | METHANE  |
| File ID: 16G53551 |       |      |  |          |
|                   |       |      | L17100037-06 RERUN AT 5X FOR METHANE   |          |
| 18                | X     | 1    | Carry-over contamination               |          |
| File ID: 16G53552 |       |      |  |          |
|                   |       |      | L17100067-01 RERUN AT 1X FOR CARRYOVER |          |

Approved: October 09, 2017

Page: 1



Microbac Laboratories Inc.  
HOLDING TIMES  
EQUIVALENT TO AFCEE FORM 9

Analytical Method: RSK175  
Login Number: L17100037

AAB# : WG632225

| Client ID      | ID | Date Collected | TCLP Date | Time Held | Max Hold | Q | Extract Date | Time Held | Max Hold | Q | Run Date | Time Held | Max Hold | Q |
|----------------|----|----------------|-----------|-----------|----------|---|--------------|-----------|----------|---|----------|-----------|----------|---|
| EB01-092817    | 01 | 09/28/17       |           |           |          |   | 10/03/2017   | 5.1       | 14       |   | 10/03/17 | 5.1       | 14       |   |
| 0306-PW-092817 | 02 | 09/28/17       |           |           |          |   | 10/03/2017   | 5         | 14       |   | 10/03/17 | 5         | 14       |   |
| 0315-PW-092817 | 03 | 09/28/17       |           |           |          |   | 10/03/2017   | 5         | 14       |   | 10/03/17 | 5         | 14       |   |
| 0309-PW-092817 | 04 | 09/28/17       |           |           |          |   | 10/03/2017   | 5         | 14       |   | 10/03/17 | 5         | 14       |   |
| 0310-PW-092817 | 05 | 09/28/17       |           |           |          |   | 10/03/2017   | 4.9       | 14       |   | 10/03/17 | 4.9       | 14       |   |
| 0311-PW-092817 | 06 | 09/28/17       |           |           |          |   | 10/03/2017   | 4.9       | 14       |   | 10/03/17 | 4.9       | 14       |   |

\* = SEE PROJECT QAPP REQUIREMENTS

HOLD\_TIMES - Modified 03/06/2008  
PDF File ID: 5517870  
Report generated 10/09/2017 15:57



## METHOD BLANK SUMMARY

Login Number:L17100037 Work Group:WG632225  
 Blank File ID:16G53536 Blank Sample ID:WG632225-01  
 Prep Date:10/03/17 08:34 Instrument ID:HP16  
 Analyzed Date:10/03/17 08:34 Method:RSK175  
 Analyst:HRF

This Method Blank Applies To The Following Samples:

| Client ID      | Lab Sample ID | Lab File ID | Time Analyzed  | TAG  |
|----------------|---------------|-------------|----------------|------|
| LCS            | WG632225-02   | 16G53543    | 10/03/17 10:03 | 01   |
| LCS2           | WG632225-03   | 16G53544    | 10/03/17 10:15 | 01   |
| EB01-092817    | L17100037-01  | 16G53546    | 10/03/17 10:57 | 01   |
| 0306-PW-092817 | L17100037-02  | 16G53547    | 10/03/17 11:51 | 01   |
| 0315-PW-092817 | L17100037-03  | 16G53548    | 10/03/17 12:02 | 01   |
| 0310-PW-092817 | L17100037-05  | 16G53550    | 10/03/17 12:25 | 01   |
| 0309-PW-092817 | L17100037-04  | 16G53554    | 10/03/17 15:26 | DL01 |
| 0311-PW-092817 | L17100037-06  | 16G53555    | 10/03/17 15:37 | DL01 |

Report Name: BLANK\_SUMMARY  
 PDF File ID: 5517871  
 Report generated 10/09/2017 15:57



Microbac Laboratories Inc.

METHOD BLANK REPORT

Login Number:L17100037 Prep Date:10/03/17 08:34 Sample ID:WG632225-01  
Instrument ID:HP16 Run Date:10/03/17 08:34 Prep Method:5021  
File ID:16G53536 Analyst:HRF Method:RSK175  
Workgroup (AAB#):WG632225 Matrix:Water Units:ug/L  
Contract #: \_\_\_\_\_ Cal ID: HP16-19-JUL-17

| Analytes | MDL  | RL   | Concentration | Dilution | Qualifier |
|----------|------|------|---------------|----------|-----------|
| Methane  | 1.00 | 5.00 | 5.00          | 1        | U         |

MDL Method Detection Limit

RL Reporting/Practical Quantitation Limit

ND Analyte Not detected at or above reporting limit

\* |Analyte concentration| > RL

Report Name:BLANK  
PDF ID: 5517872  
09-OCT-2017 15:57

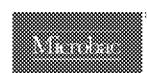


Microbac Laboratories Inc.  
LABORATORY CONTROL SAMPLE (LCS)

Login Number:L17100037 Analyst:HRF Prep Method:5021  
Instrument ID:HP16 Matrix:Water Method:RSK175  
Workgroup (AAB#):WG632225 Units:ug/L  
QC Key:DOWWVO2012 Lot #:STD81961  
Sample ID:WG632225-02 LCS File ID:16G53543 Run Date:10/03/2017 10:03  
Sample ID:WG632225-03 LCS2 File ID:16G53544 Run Date:10/03/2017 10:15

| Analytes | LCS   |       |       | LCS2  |       |       | %RPD | %Rec Limits | RPD Lmt | Q |
|----------|-------|-------|-------|-------|-------|-------|------|-------------|---------|---|
|          | Known | Found | % REC | Known | Found | % REC |      |             |         |   |
| Methane  | 119   | 106   | 89.4  | 119   | 114   | 96.1  | 7.18 | 85 - 115    | 20      |   |

LCS\_LCS2 - Modified 03/06/2008  
PDF File ID: 5517873  
Report generated: 10/09/2017 15:57



## Calibration Table Report

Method: RSNEXT.M

Title: RSK175 HP16 (SOP: OVL RSK01) 071917

Last Calibration: Wed Jul 19 13:10:09 2017

Curve: WG622365

## Calibration Files

|                  | 0.67       | 1.67       | 33.3       | 66.7       | 133        | 333        | 533        | Avg        | %RSD  | Linear |
|------------------|------------|------------|------------|------------|------------|------------|------------|------------|-------|--------|
| Compound         | 16G52893.C | 16G52901.C | 16G52896.C | 16G52896.D | 16G52897.C | 16G52898.D | 16G52899.D |            |       |        |
| T methane        | 404814.134 | 179170.390 | 185752.785 | 186907.089 | 191806.647 | 191118.962 | 223262.000 | 39.889     | 0.999 |        |
| T ethene         | 266195.252 | 286227.170 | 318869.271 | 315554.300 | 333256.863 | 327471.890 | 307932.000 | 8.456      |       |        |
| T acetylene      | 280592.466 | 285709.309 | 336070.215 | 333164.754 | 354071.693 | 348070.500 | 322946.000 | 9.648      |       |        |
| T ethane         | 324174.761 | 279681.343 | 300601.101 | 333467.737 | 330689.412 | 349780.337 | 343991.940 | 323198.000 | 7.690 |        |
| T propane        | 460074.754 | 400329.428 | 443530.965 | 497370.841 | 481122.200 | 516070.457 | 501551.933 | 471436.000 | 8.498 |        |
| T n-butane       | 604696.265 | 528083.755 | 593463.357 | 662647.230 | 633057.068 | 685719.032 | 660473.352 | 624023.000 | 8.585 |        |
| Signal #2        | 0.000      | 0.000      | 0.000      | 0.000      | 0.000      | 0.000      | 0.000      | 0.000      | 0.000 |        |
| T carbon dioxide | 6440.955   | 5959.880   | 6328.306   | 6090.624   | 6380.632   | 6359.162   | 6259.960   | 3.036      |       |        |

Wed Jul 19 13:19:18 2017

Microbac Laboratories Inc.  
ALTERNATE SOURCE CALIBRATION REPORT

Login Number:L17100037 Run Date:07/19/2017 Sample ID:WG622365-08  
Instrument ID:HP16 Run Time:12:06 Method:RSK175  
File ID:16G52902 Analyst:HRF QC Key:DOWWVO2012  
ICal Workgroup:WG622365 Cal ID: HP16 - 19-JUL-17

| Analyte | Expected | Found | Units | RF     | %D   | UCL | Q |
|---------|----------|-------|-------|--------|------|-----|---|
| methane | 228      | 221   | ug/L  | 185000 | 2.80 | 15  |   |

\* Exceeds %D Limit

ALT - Modified 09/06/2007  
Version 1.5 PDF File ID: 5517874  
Report generated 10/09/2017 15:57



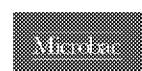
Microbac Laboratories Inc.  
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number:L17100037 Run Date:10/03/2017 Sample ID:WG632224-01  
Instrument ID:HP16 Run Time:08:22 Method:RSK175  
File ID:16G53535 Analyst:HRF QC Key:DOWWVO2012  
Workgroup (AAB#):WG632225 Cal ID: HP16 - 19-JUL-17  
Matrix:WATER

| Analyte | Expected | Found | UNITS | RF     | %D   | UCL | Q |
|---------|----------|-------|-------|--------|------|-----|---|
| methane | 228      | 214   | ug/L  | 180000 | 5.95 | 15  |   |

\* Exceeds %D Criteria

CCV - Modified 03/05/2008  
PDF File ID: 5517875  
Report generated 10/09/2017 15:57



Microbac Laboratories Inc.  
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number:L17100037 Run Date:10/03/2017 Sample ID:WG632224-02  
Instrument ID:HP16 Run Time:10:28 Method:RSK175  
File ID:16G53545 Analyst:HRF QC Key:DOWWVO2012  
Workgroup (AAB#):WG632225 Cal ID: HP16 - 19-JUL-17  
Matrix:WATER

| Analyte | Expected | Found | UNITS | RF     | %D    | UCL | Q |
|---------|----------|-------|-------|--------|-------|-----|---|
| methane | 228      | 229   | ug/L  | 192000 | 0.645 | 15  |   |

\* Exceeds %D Criteria

CCV - Modified 03/05/2008  
PDF File ID: 5517875  
Report generated 10/09/2017 15:57



Microbac Laboratories Inc.  
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number:L17100037 Run Date:10/03/2017 Sample ID:WG632224-03  
Instrument ID:HP16 Run Time:15:49 Method:RSK175  
File ID:16G53556 Analyst:HRF QC Key:DOWWVO2012  
Workgroup (AAB#):WG632225 Cal ID: HP16 - 19-JUL-17  
Matrix:WATER

| Analyte | Expected | Found | UNITS | RF     | %D    | UCL | Q |
|---------|----------|-------|-------|--------|-------|-----|---|
| methane | 228      | 226   | ug/L  | 190000 | 0.597 | 15  |   |

\* Exceeds %D Criteria

CCV - Modified 03/05/2008  
PDF File ID: 5517875  
Report generated 10/09/2017 15:57



# **3.0 Attachments**

Microbac Laboratories Inc.  
Ohio Valley Division Analyst List  
November 2, 2017

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|                                  |  |
|----------------------------------|--|
| 001 - BIO-CHEM TESTING WVDEP 220 | 002 - REIC Consultants, Inc. WVDEP 060 |
| 003 - Sturm Environmental        | 004 - MICROBAC PITTSBURGH              |
| 005 - ES LABORATORIES            | 006 - ALCOSAN LABORATORIES             |
| 007 - ALS LABORATORIES           | 008 - BENCHMARK LABORATORIES           |
| 010 - MICROBAC CHICAGOLAND       | AC - AMBER R. CARMICHAEL               |
| ADC - ANTHONY D. CANTER          | ADG - APRIL D. GREENE                  |
| ALS - ADRIANE L. STEED           | AWE - ANDREW W. ESSIG                  |
| AZH - AFTER HOURS                | BJO - BRIAN J. OGDEN                   |
| BLG - BRENDA L. GREENWALT        | BLR - BRANDON L. RICHARDS              |
| BNB - Brandi N. Bentley          | BRG - BRENDA R. GREGORY                |
| CAS - Craig A. Smith             | CEB - CHAD E. BARNES                   |
| CLC - CHRYS L. CRAWFORD          | CLG - CARA L. GREENWOOD                |
| CLS - CARA L. STRICKLER          | CPD - CHAD P. DAVIS                    |
| CSH - CHRIS S. HILL              | CV - Carl Volkman                      |
| DAK - DEAN A. KETELSEN           | DCM - DAVID C. MERCKLE                 |
| DEV - DAVID E. VANDENBERG        | DIH - DEANNA I. HESSON                 |
| DLB - DAVID L. BUMGARNER         | DLP - DOROTHY L. PAYNE                 |
| DSM - DAVID S. MOSSOR            | DTG - DOMINIC T. GEHRET                |
| ECL - ERIC C. LAWSON             | EPT - ETHAN P. TIDD                    |
| ERP - ERIN R. PORTER             | FJB - FRANCES J. BOLDEN                |
| HRF - HEATHER R. FAIRCHILD       | JDH - JUSTIN D. HESSON                 |
| JDS - JARED D. SMITH             | JKP - JACQUELINE K. PARSONS            |
| JLD - JESSICA L. DELONG          | JST - JOSHUA S. TAYLOR                 |
| JTP - JOSHUA T. PEMBERTON        | JWR - JOHN W. RICHARDS                 |
| JWS - JACK W. SHEAVES            | JYH - JI Y. HU                         |
| KAK - KATHY A. KIRBY             | KDD - Katelyn D. Daley                 |
| KEB - KATIE E. BARNES            | KHR - KIM H. RHODES                    |
| KKB - KERRI K. BUCK              | KLC - KELLY L. CARVER                  |
| KRA - KATHY R. ALBERTSON         | KRP - KATHY R. PARSONS                 |
| LJH - Lacey J. Hendershot        | LLS - LARRY L. STEPHENS                |
| LSB - LESLIE S. BUCINA           | LSJ - LAURA S. JONES                   |
| MAP - MARLA A. PORTER            | MBK - MORGAN B. KNOWLTON               |
| MES - MARY E. SCHILLING          | MMB - MAREN M. BEERY                   |
| MRT - MICHELLE R. TAYLOR         | OJE - OMOYEMWEN J. ENGLISH             |
| PDM - PIERCE D. MORRIS           | PIT - MICROBAC WARRENDALE              |
| RAF - REBEKAH A. FINN            | REK - BOB E. KYER                      |
| RLB - BOB BUCHANAN               | RNP - RICK N. PETTY                    |
| SAV - SARAH A. VANDENBERG        | SCA - SUEELLEN C. ADAMS                |
| SCB - SARAH C. BOGOLIN           | SCJ - SUE ELLEN C. JOHNSON             |
| SDC - SHALYN D. CONLEY           | TB - TODD BOYLE                        |
| TMB - TIFFANY M. BAILEY          | TMM - TAMMY M. MORRIS                  |
| VC - VICKI COLLIER               | WTD - WADE T. DELONG                   |
| XXX - UNAVAILABLE OR SUBCONTRACT | ZTB - ZACH T. BARNES                   |

## Microbac Laboratories Inc.

## List of Valid Qualifiers

November 02, 2017

Qualkey: DOWWVO

| <u>Qualifier</u> | <u>Description</u>   |
|------------------|--|
| *                | Surrogate or spike compound out of range   |
| +                | Correlation coefficient for the MSA is less than 0.995   |
| <                | Result is less than the associated numerical value.  |
| >                | Result is greater than the associated numerical value.   |
| >,H1             | Result is greater than the associated numerical value. Sample analysis performed past holding time.  |
| A                | See the report narrative   |
| B                | Analyte present in method blank  |
| B,H1             | Analyte present in method blank. Sample analysis performed past holding time.  |
| B1               | Target analyte detected in method blank at or above the method reporting limit   |
| B3               | Target analyte detected in calibration blank at or above the method reporting limit  |
| B4               | The BOD unseeded dilution water blank exceeded 0.2 mg/L  |
| C                | Confirmed by GC/MS   |
| CG               | Confluent growth   |
| CT1              | The cooler temperature at receipt exceeded regulatory guidelines for requested testing.  |
| DL               | Surrogate or spike compound was diluted out  |
| E                | Estimated concentration due to interference.   |
| E,CT1            | Estimated results. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.   |
| EDL              | Elevated sample reporting limits, presence of non-target analytes  |
| EMPC             | Estimated Maximum Possible Concentration   |
| F, S             | Estimated result below quantitation limit; method of standard additions(MSA)   |
| F,CT1            | Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.   |
| FL               | Free Liquid  |
| FP1              | Did not ignite.  |
| H1               | Sample analysis performed past holding time.   |
| H1,CT1           | Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.                           |
| I                | Semiquantitative result (out of instrument calibration range)  |
| J                | Estimated concentration.   |
| J                | The analyte was positively identified, but the quantitation was below the RL.  |
| J,B              | Analyte detected in both the method blank and sample above the MDL.  |
| J,CT1            | Estimated value; the analyte concentration was less than the RL/LOQ.   |
| J,CT1            | Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.   |
| J,P              | Estimate; columns don't agree to within 40%  |
| J,S              | Estimated concentration; analyzed by method of standard addition (MSA)   |
| L                | Sample reporting limits elevated due to matrix interference  |
| L1               | The associated blank spike (LCS) recovery was above the laboratory acceptance limits.  |
| L2               | The associated blank spike (LCS) recovery was below the laboratory acceptance limits.  |
| M                | Matrix effect; the concentration is an estimate due to matrix effect.  |
| N                | Tentatively identified compound(TIC)   |
| NA               | Not applicable   |
| ND               | Not detected at or above the reporting limit (RL)  |
| ND, B            | Not detected at or above the reporting limit (RL). Analyte present in method blank.  |
| ND, CT1          | Analyte was not detected. The concentration is below the reported LOD. The cooler temperature at receipt exceeded regulatory guidelines for requested testing. |
| ND, L            | Not detected; sample reporting limit (RL) elevated due to interference   |
| ND, S            | Not detected; analyzed by method of standard addition (MSA)  |
| ND,H1            | Not detected; Sample analysis performed past holding time.   |
| ND,H1,CT1        | Not detected; Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.             |
| NF               | Not found by library search  |
| NFL              | No free liquid   |
| NI               | Non-ignitable  |
| NR               | Analyte is not required to be analyzed   |
| NS               | Not spiked   |
| P                | Concentrations >40% difference between the two GC columns  |
| Q                | One or more quality control criteria failed. See narrative.  |
| QNS              | Quantity of sample not sufficient to perform analysis  |
| RA               | Reanalysis confirms reported results   |
| RE               | Reanalysis confirms sample matrix interference   |
| S                | Analyzed by method of standard addition (MSA)  |
| SMI              | Sample matrix interference on surrogate  |
| SP               | Reported results are for spike compounds only  |
| TIC              | Tentatively Identified Compound  |
| TNTC             | Too numerous to count  |
| TNTC, B          | Too numerous to count. Analyte present in method blank.  |
| TNTC,CT1         | Too numerous to count. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.   |
| TNTC,H1          | Too numerous to count. Sample analysis performed past holding time.  |
| U                | Not detected at or above the reporting limit (RL).   |
| UJ               | Undetected; the MDL and RL are estimated due to quality control discrepancies.   |
| UQ               | Undetected; the analyte was analyzed for, but not detected.  |



Microbac Laboratories Inc.

List of Valid Qualifiers

November 02, 2017

Qualkey: DOWWVO

W  
X  
X, S  
Z

Post-digestion spike for furnace AA out of control limits  
Exceeds regulatory limit  
Exceeds regulatory limit; method of standard additions (MSA)  
Cannot be resolved from isomer - see below



COC No. A53013

158 Starlite Drive

Marietta, OH 45750



Phone: 740-373-4071

Toll Free: 800-373-4071

## CHAIN-OF-CUSTODY RECORD

|   |   |
|---|---|
| Company Name:<br><b>C H2m HILL</b>                  |   |
| Project Contact:<br><b>Shane Lowe</b>               | Contact Phone #:<br><b>314-335-3024</b> |
| Turn Around Requirements:<br><b>Standard 21-day</b> | Location:<br><b>Institute, WV</b>       |
| Project ID:<br><b>SC-Institute Area 3</b>           |   |
| Sampler (print):<br><b>Lisa Raterink</b>            | Signature:<br>                          |

Program

CWA  
 RCRA  
 DOD  
 APCEE  
 Other \_\_\_\_\_

TOTAL # (LAB USE)

## ADDITIONAL REQUIREMENTS

| Sample I.D. No. | Comp | Date    | Time | Matrix* | NUMBER OF CONTAINERS |   | Hold | Mobile/Hand | Mobile/Hand |
|-----------------|------|---------|------|---------|----------------------|---|------|-------------|-------------|
|                 |      |         |      |         | 4                    | 6 |      |             |             |
| EBO1-092817     | X    | 9/28/17 | 0820 | W       | X                    | X |      |             |             |
| D306-PW-092817  | X    | 9/28/17 | 1150 | W       | (6)                  | X |      |             |             |
| 0315-PW-092817  | X    | 9/28/17 | 1300 | W       | 6                    | X |      |             |             |
| 0309-PW-092817  | X    | 9/28/17 | 1425 | W       | 6                    | X |      |             |             |
| 0310-PW-092817  | X    | 9/28/17 | 1550 | W       | 6                    | X |      |             |             |
| 0311-PW-092817  | X    | 9/28/17 | 1740 | W       | 6                    | X |      |             |             |
| TB01-092817     | X    | 9/28/17 | 1800 | W       | 2                    | X |      |             |             |

|                                     |                 |              |                             |
|-------------------------------------|-----------------|--------------|-----------------------------|
| Relinquished by:<br>(Signature)<br> | Date<br>9/28/17 | Time<br>1900 | Received by:<br>(Signature) |
| Relinquished by:<br>(Signature)<br> | Date<br>9-28-17 | Time<br>1120 | Received by:<br>(Signature) |



Microbac OVD

Received: 09/29/2017 11:20

By: CARA STRICKLER

221000106801

Date \_\_\_\_\_ Time \_\_\_\_\_ Received by:  
(Signature)9-28-17  
0925

Remarks:

Page 1 of 1

\*Water (W), Soil (S), Solid Waste (SD), Unknown (X)

ED\_002092A\_00004602-00278



COOLER TEMP >6° C LOG

Cooler ID 1080

pH Lot # NA

Document Control # 1957  
Last 10-07-2016

Issued to: Document Master File

**Microbac Laboratories Inc.**

Internal Chain of Custody Report

**Login:** L17100037**Account:** 2736**Project:** 2736.134**Samples:** 7**Due Date:** 10-OCT-2017

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u> |
|---------------------|---------------------|-----------------|
| L17100037-01        | 974032              |                 |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:35 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:35 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:35 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u>    |
|---------------------|---------------------|--------------------|
| L17100037-01        | 974033              | 826-SPE RSK175-SPE |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
 A2 - Sample Archive (AMBIENT)  
 F1 - Volatiles Freezer in Login  
 V1 - Volatiles Refrigerator in Login  
 W1 - Walkin Cooler in Login



**Microbac Laboratories Inc.**

Internal Chain of Custody Report

**Login:** L17100037**Account:** 2736**Project:** 2736.134**Samples:** 7**Due Date:** 10-OCT-2017

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u> |
|---------------------|---------------------|-----------------|
| L17100037-02        | 974034              |                 |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:36 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:36 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:36 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u>    |
|---------------------|---------------------|--------------------|
| L17100037-02        | 974035              | 826-SPE RSK175-SPE |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
 A2 - Sample Archive (AMBIENT)  
 F1 - Volatiles Freezer in Login  
 V1 - Volatiles Refrigerator in Login  
 W1 - Walkin Cooler in Login



**Microbac Laboratories Inc.**

Internal Chain of Custody Report

**Login:** L17100037**Account:** 2736**Project:** 2736.134**Samples:** 7**Due Date:** 10-OCT-2017

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u> |
|---------------------|---------------------|-----------------|
| L17100037-03        | 974036              |                 |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:35 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:35 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:35 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u>    |
|---------------------|---------------------|--------------------|
| L17100037-03        | 974037              | 826-SPE RSK175-SPE |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
 A2 - Sample Archive (AMBIENT)  
 F1 - Volatiles Freezer in Login  
 V1 - Volatiles Refrigerator in Login  
 W1 - Walkin Cooler in Login



**Microbac Laboratories Inc.**

Internal Chain of Custody Report

**Login:** L17100037**Account:** 2736**Project:** 2736.134**Samples:** 7**Due Date:** 10-OCT-2017

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u> |
|---------------------|---------------------|-----------------|
| L17100037-04        | 974038              |                 |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:35 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:35 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:35 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u>    |
|---------------------|---------------------|--------------------|
| L17100037-04        | 974039              | 826-SPE RSK175-SPE |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
 A2 - Sample Archive (AMBIENT)  
 F1 - Volatiles Freezer in Login  
 V1 - Volatiles Refrigerator in Login  
 W1 - Walkin Cooler in Login



**Microbac Laboratories Inc.**

Internal Chain of Custody Report

**Login:** L17100037**Account:** 2736**Project:** 2736.134**Samples:** 7**Due Date:** 10-OCT-2017

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u> |
|---------------------|---------------------|-----------------|
| L17100037-05        | 974040              |                 |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:35 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:35 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:35 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u>    |
|---------------------|---------------------|--------------------|
| L17100037-05        | 974041              | 826-SPE RSK175-SPE |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
 A2 - Sample Archive (AMBIENT)  
 F1 - Volatiles Freezer in Login  
 V1 - Volatiles Refrigerator in Login  
 W1 - Walkin Cooler in Login



**Microbac Laboratories Inc.**

Internal Chain of Custody Report

**Login:** L17100037**Account:** 2736**Project:** 2736.134**Samples:** 7**Due Date:** 10-OCT-2017

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u> |
|---------------------|---------------------|-----------------|
| L17100037-06        | 974042              |                 |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:35 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:35 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:35 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Comments:Products cancelled.

| <u>Samplenumber</u> | <u>Container ID</u> | <u>Products</u>    |
|---------------------|---------------------|--------------------|
| L17100037-06        | 974043              | 826-SPE RSK175-SPE |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

Bottle: 3

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            | <2 |
| 2    | ANALYZ  | V1     | ORG1 | 03-OCT-2017 07:34 | AWE    | CLS        |    |
| 3    | STORE   | ORG1   | A2   | 17-OCT-2017 07:15 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
 A2 - Sample Archive (AMBIENT)  
 F1 - Volatiles Freezer in Login  
 V1 - Volatiles Refrigerator in Login  
 W1 - Walkin Cooler in Login



**Microbac Laboratories Inc.**

Internal Chain of Custody Report

**Login:** L17100037**Account:** 2736**Project:** 2736.134**Samples:** 7**Due Date:** 10-OCT-2017

| <u>Samplenum</u> | <u>Container ID</u> | <u>Products</u> |
|------------------|---------------------|-----------------|
| L17100037-07     | 974044              | 826-SPE         |

Bottle: 1

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:35 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

Bottle: 2

| Seq. | Purpose | From   | To   | Date/Time         | Accept | Relinquish | pH |
|------|---------|--------|------|-------------------|--------|------------|----|
| 1    | LOGIN   | COOLER | V1   | 02-OCT-2017 09:52 | BRG    |            |    |
| 2    | ANALYZ  | V1     | ORG4 | 03-OCT-2017 07:35 | AWE    | CLS        |    |
| 3    | STORE   | ORG4   | A2   | 17-OCT-2017 07:17 | CLS    | AWE        |    |

A1 - Sample Archive (COLD)  
A2 - Sample Archive (AMBIENT)  
F1 - Volatiles Freezer in Login  
V1 - Volatiles Refrigerator in Login  
W1 - Walkin Cooler in Login

